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VETERINARY MEDICINE

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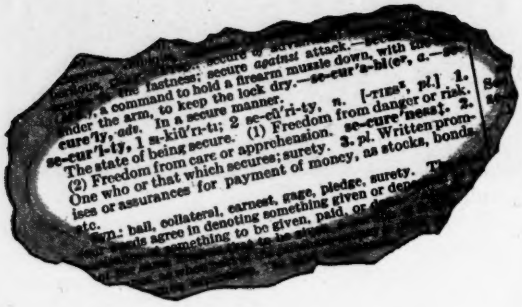
se-cur'i-ty, 1 si-kiu'ri-ti; 2 se-cū'ri-ty, n. [-TIES, pl.] 1.
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(2) Freedom from care or apprehension. se-cure'ness, 2.
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D. M. Campbell, Editor A. T. Kinsley, Associate Editor

According to Wallace, University of Minnesota, one species of crayfish, *Cambarus immunis spinirostris,* is an intermediate host of the lung fluke, *Paragonimus kellicotti,* of the cat. Lung flukes are a factor in mink fur farming. It is probable that aquatic animals are the intermediate hosts.

Joseph C. Aub, of the Massachusetts General Hospital, Boston, reports that the intravenous injection of calcium chloride solution stops the pain of gall-stone colic and lead poisoning almost instantly. The results are as dramatic as those attending its use in milk fever in cows.

Approximately 75% of the fertilizing constituents of feeds fed in beef production is returned in the manure, thus the feeding of cattle not only conserves fertilizer and fertility when applied to the soil, but also provides an economical method of disposing of grain and roughage produced on farms.

Sparrows have their difficulties. Of 95 English sparrows examined from southeastern Minnesota, Boughton found 66 or over 70 per cent were infested with a coccidia of the genus Isospora. Attempts to infest chicks with this parasite failed, in fact there has been no case reported in the available literature of poultry coccidiosis caused by a member of this genus.

A creamery to be profitable must have an ample number of cows available within a radius of 10 to 20 miles. To produce 200,000 pounds of butter annually requires 1,000 cows that will average 200 pounds of butter fat each year. A veterinarian located in a creamery community has the assurance of a good income.

"A horse fed oats contaminated with a culture of *Br. abortus* produced specific antibodies without showing pathological symptoms (agglutination titer 1:3200). Another horse, fed with the same cultures killed by heat developed no antibodies." The foregoing quotation (No. 4663, Biological Abstracts) is of interest and may throw some light on the finding of antibodies in humans that have consumed milk from cows affected with Bang's disease.

Infectious bronchitis of fowls is prevalent on the poultry farms of California. The disease has been observed in chickens, turkeys, pigeons and ducks and in wild quail, sparrows and blackbirds. The causative agent is present in the tracheal exudate of infected fowls, but not in other organs.

It is thought by research workers of the California Station to be due to a filtrable virus. No measures attempted for the prevention of the disease were successful.

The production of wool is usually at the maximum in sheep at one year of age.

Lightening rods are frequently placed on trees, for the protection of valuable trees, and also to protect animals that take shelter under them during storms.

Salmon and other sea foods have a relatively high iodine content and are therefore of considerable value in the prevention of goitre. The iodine in canned salmon is available and utilizable.

BEGIN NOW ON LICENSE RECIPROCITY

I have read with a great deal of interest the articles by Rembrandt Morgan (June 1931, page 217) and F. R. Barlow (July 1931, page 273) on reciprocity in licenses.

I agree heartily with both articles and I hope that many more practitioners will take it up and put things into action and bring it before the A. V. M. A., as I believe that is the proper place for it to come up for discussion.

I can't see why, when a practitioner is licensed to practice in one state and is a graduate of a recognized school, that he should not be qualified to practice anywhere in the United States without taking any more State Board examinations. State Boards should have confidence enough in one another to accept one another's findings. The questions and examinations are not so very different in any of the states.

I hope this matter will come before the A. V. M. A. at the Kansas City meeting and either be passed on or a committee appointed to work for this proposition. If the A. V. M. A. wants to help us veterinarians, I believe they will give this question consideration.

I have talked it over with President Hall, and he is favorable to its consideration at the meeting.

If we can't get reciprocity among all the states, let it be instituted among those that are ready, and keep after the rest.

O. F. Foley.

Bridgewater, Virginia.

In work at the Research Institute of the Royal Veterinary College at London, the *B. welchii* was found to be the cause of black leg in sheep.

Although blackleg in cattle is caused most frequently by *B. chauvoei, Vibrion septique B. perfringens* and *B. edematiens* and other anaerobes may cause it either alone or in combination with each other. Methods of prevention need not, however, take into account this varying pathogenesis since cross-immunization occurs with this group of organisms.

The normal average volume of the cream layer on milk is 4.1 times the butter fat content of the milk. Heating for 30 minutes (pasteurization) does not effect the creaming at temperatures under 141°F. Nor does it lessen it materially except at temperatures of 145°F. and above. Prolonged heating (three hours or more) reduces the cream layer even at 141°F.

In an investigation conducted by the U. S. Public Health Service, canned haddock and green peas were found to possess in a rather low degree the black tongue preventive factor (vitamin P-P or B_2). Lard and salt pork were found to be poor sources of black tongue preventive, and 50% or more of the test animals on lard, salt pork and haddock diets showed post mortem evidence of fatty degeneration of the liver.

In comparative tests of 36 strains of abortion organisms obtained from different laboratories and a culture freshly isolated from the milk of an aborting cow, using both the rapid, plate and the slow, tube methods, Baker and Palmer of the Delaware Station found that: (1), certain laboratory strains were more antigenic than others; (2) the most antigenic strains were those that had been originally isolated from fetuses of aborting cows, and (3) the freshly isolated strain was not as antigenic as strains which had been growing numerous generations upon laboratory media.

The work of the Bureau of Animal Industry involves the building up of the animal industry of the United States, the conserving and safeguarding of the health of our live stock, and more important still, the protection of the people from maladies which might be contracted from animals and their products. —A. S. Alexander, in *Better Crops with Plant Food.*

Melioidosis is a specific infective disease of rats, humans and horses, caused by the *B. Whitmori.* This disease has been identified in Asia. Whitmorine is the name of a diagnostic product prepared from *B. whitmori. B. whitmori* and *B. mallei* are apparently closely related for whitmorine produces a reaction in glandered horses and mallein produces a reaction in humans affected with melioidosis.—*Trop. Vet. Bul.* 18-2.

Ovine caseous lymphadenitis is a subacute or chronic infective disease primarily involving lymphoid tissue and characterized by suppuration and usually caseation. Because of the chronicity of this malady it is observed most frequently in mature or aged sheep. Thus, Woodruff and Gregory of Australia inspected one band of sheep and reported the following: no infection in lambs, 5.8% infection in yearlings, 27% infection in two-year-old sheep, and 39% infection in three-year-old sheep.

Wounds are the usual avenue of infection of the causative microbe, *B. preisz.* Shearing is the most common cause of skin wounds in sheep. There is an average of one hundred skin wounds produced in shearing according to Woodruff and Gregory. From four samples of pus or scab from infected shear wounds, the *B. preisz* was isolated by guinea pig inoculation in three instances by McGrath. The foregoing relates to Australia. It would be interesting to know whether or not the statements are applicable to sheep shearing and caseous lymphadinitis in the United States.—*Trop. Vet. Bul.* 18-2.

Tularemia has recently been identified in a miner in Ontario and in a snowshoe rabbit in British Columbia. These localities are widely separated and are a considerable distance from the United States border and it is assumed that the infection in Canada has no direct relation with tularemia in the States.—*Science* 1882.

Rabbits in Europe are affected by or at least are carriers of a filtrable virus that causes a rather serious malady in the human. The virus is transmitted to man by handling diseased rabbits. From two to nine days after exposure, the patient develops a high temperature that persists for from five to seven days, after which painful enlargements of the cubital, axillary and cervical lymph nodes occurs. Infected rabbit meat is rendered harmless by cooking and, fortunately, the disease is not fatal to man.—*Bio. Abst.* 15467.

Coyote killing dogs are a valuable asset to the sheep and goat industry in the west. Dogs may be compared to boys. If a 14 or 15 year old boy is whipped in his first two or three encounters, he is prone to become shy and refuse to fight, so also a young dog that is whipped becomes shy. Ranchers appreciate the necessity of having a young dog kill the first coyotes they encounter and the rancher traps two or three coyotes and while in the trap may help the dog kill the coyote and the dog becomes confident of his ability and is usually a good coyote killer.—*Angora Journal.*

In a detailed study of the skeletal structure of 3,957 pigs Shaw found the number of ribs varied from 13 to 17 pairs. These variations occurred in all breeds but an excess in the number of ribs was definitely associated with the larger breeds of swine. The number of cervical vertebrae was constant (even the giraffe and the ground mole possess the same number of cervical vertebrae), but there was a variation in the number of thoracic and lumbar vertebrae.—*Bio. Abst.* 16255.

The Veterinary Profession*

VETERINARY medicine is essentially and potentially a dignified, scientific profession. We have no reason to be ashamed of our profession as compared with the medical profession, or with law or other professions. We have our weak spots and our bad spots, but veterinary medicine is a worthwhile profession. Certainly as worthwhile as the profession of law, which is still dominated by the ancient superstition that you can make laws that will effectively regulate conduct and morals; and that you can settle things by argument almost regardless of the facts in the case. The more I look at lawyers and their works, the better I like veterinarians, and when one views the activities of Billy Sunday or Amy Semple McPherson, he feels inclined to be proud that he belongs to the veterinary and not to the clerical profession.

From the days of empirics to the present time, the veterinary profession has been going steadily forward and I predict that within the next 25 years it will be recognized everywhere as a learned profession. It is a weakness of human psychology to generalize. We see a single Icelander for example, and immediately we draw the conclusion that all Icelanders are like the one we see. We come to know a Russian and find him a very disagreeable or a very agreeable person and at once, we conclude that all Russians are very disagreeable or very agreeable persons. The attitude of the public toward us is the same. The individual veterinarian gives the reputation to the veterinary profession in his locality. Whatever we do, where we are distinctly labeled as veterinarians, we give the impression of the veterinary profession. We need to be careful in this because the veterinary profession has not yet an established place. After a profession or an individual has "arrived" it or he can do almost anything and get away with it. While he is on trial he must be in a measure, circumspect.

In the struggle for existence that we call civil life, as in warfare, it is important to get there first. To us this applies particularly to milk and meat inspection. This is a field that rightfully belongs to the veterinarian. It has been invaded to a considerable extent by those less qualified than ourselves. We should lose no time in preëmpting this field so far as it is yet unoccupied and take measures to get control of such portions of it as is already in other and less qualified hands. It will be much harder for us to get this field after it is preëmpted by others than it will be before that occurs.

During the past year, I have given a good deal of time to thinking about the veterinary profession. I have worked out a sort of tentative program that I offer you just to be looked over. You may want to adopt some sort of a program at this time, or you may not. If you do want to adopt some plan of progress for reaching your objective, some part of this program may be suitable or it may not. I am presenting it to you now for suggestions and criticisms. It is a purely tentative and preliminary platform and is offered for consideration only.

1. The A. V. M. A. and state and local veterinary associations should adopt a continuing policy and strive consistently to carry it out.

2. Ethical and esthetic matters affecting the profession should receive consideration.

3. Public entertainments at veterinary meetings should be in good taste and should avoid the appearance, or any suggestion, that veterinarians are rough necks, for it isn't true and it is wrong to give the public a false impression.

*Notes from an address by Maurice C. Hall, Chief, Zoological Division, B. A. I., Washington, D. C., at the Eighth Annual Post-Graduate Short Course for Veterinarians, Michigan State College, East Lansing, January 26-30, 1931.

4. A survey should be made to ascertain the radius of service of the practicing veterinarian with a view to avoiding harmful competition on the one hand, and neglect of sections of the animal industry upon the other.

5. Attention should be given to a program for bringing about more widespread meat inspection and milk inspection and a greater participation of veterinarians in public health work; and measures should be taken to guarantee that veterinarians recommended for such work are well qualified for it.

6. A regular program should be instituted to the end that all boards of health should have a veterinarian as one of its members, and boards of agriculture be similarly organized. This should not be left to chance as it is at the present time.

7. State veterinary associations should endeavor to get civil-service requirements instituted for the position of state veterinarian. It is nonsensical that such an office should depend upon political affiliations.

8. Certain ethical and professional standards for the veterinarian should be established and the full influence of our professional organizations exerted to the end that so far as possible, veterinarians, as individuals, live up to such standards.

9. A program working to an enlargement of the affiliations of the individual veterinarian and of his responsibilities and duties of citizenship should be instituted.

10. The veterinary profession as a whole should promote proper remuneration for individuals both in private practice and on public salary.

11. The curriculum of our veterinary colleges should be rendered flexible. It should be based upon needs and not upon precedent.

12. Measures should be taken to regulate the supply of veterinarians. A smaller number of a better product may be more profitable to the country as a whole than a larger number of a poorer product. The development of one Pasteur in the veterinary profession would benefit it more in the eyes of the public than 10,000 ordinary men.

13. The amount of cultural instruction for the veterinary student should be increased. His need for it is greater than that of the medical student. His field of professional activity is broader than that of the physician.

14. The keeping of careful records and a habit of recording one's observations should be inculcated into the young veterinarian's habits before he leaves college.

15. A program for cooperation between county agents and veterinary practitioners should be worked out; the one to deal with prevention and the other with diagnosis and treatment of disease.

16. There should be more cooperation in veterinary practice. This could be brought about with a saving in expense and improvement in service and a convenience to the participants, rendering a better service to the livestock industry at no increased cost.

17. The veterinarian in practice should regard his work as research, and without prejudicing the interests of his clients, should carry out regularly and report promptly a certain amount of experimental work in connection with his practice.

18. The whole-hearted support of the veterinary profession of the country should be given to the Veterinary Corps of the Army.

19. The A. V. M. A. and state and local veterinary associations should interest themselves in the United States and Canadian veterinary service and hold conferences with the heads of those services with a view to creating a program that can be carried out to their mutual advantage.

20. Our support should be given to ethical commercial houses who regard veterinary medicine as a science and not a faith, and who offer sound evidence that their preparations are reasonably suitable for the things for which they offer them.

Milk Control

By ARTHUR H. WILLIAMSON, Charlotte, North Carolina

IF WE will but glance at statistics on milk-borne diseases we readily see how very fraught with danger is an unsupervised or improperly supervised milk supply. The primary reasons for supervision are not only to prevent these milk-borne diseases by keeping polluted products from reaching the consuming public but to prevent nutritional diseases such as pellagra and rachitis by increasing consumption of pure, wholesome products.

This angle should not be overlooked. Brights minds and healthy bodies are our debt to posterity and there is no greater way of making this bequest than by stimulating the consumption of nature's greatest body builder—milk.

Good milk cannot be "legislated" on any market. *Education* is the keynote to the situation. The public must be educated to demand a better product and the dairymen must be instilled with a desire to furnish it. This is, of necessity, a gradual process and is best accomplished by:

Enlisting the aid of the press, working through the schools and civic organizations, by placards and pamphlets, and by frequent meetings between health officials and producers. Visual education is a new and effective method to disseminate knowledge. A story in moving pictures is more effective than one conveyed in any other manner.

A program of this nature carried over a long period of time will result in a demand on the "powers that be" by the public and even by the dairymen themselves for a regulated milk supply. The dairymen who wish to install modern equipment and inaugurate up-to-date methods realize they must have protection and are entitled to it. That protection can be had only in the form of an "ordinance."

In formulating this ordinance it is imperative that only *essentials* to the production of a pure and wholesome product be included so as to minimize the expense to the distributors. Dissention will surely arise if those in authority force so much expense on the distributors they cannot make a reasonable return on their investment. You cannot force a dairyman to produce good milk every day. You must sell him on the idea and he will do it of his own volition, and to do this the supervisor must have the unbounded confidence of the men with whom he works.

To gain this confidence and keep it the supervisor must have a thorough knowledge of his work and the ability to impart that knowledge, but most of all he must have a sympathetic understanding of the dairyman's problems. Even though a supervisor should have, at all times, the authority of an enforcement officer, it is unwise to show that authority except in flagrant cases. It should be remembered that a resort to force is an admission of failure to sell ideas. The dairyman should not feel that he must hide his troubles from the supervisor, but should feel, on the other hand, that he can go to the supervisor with his problems and get a sympathetic ear and expert assistance in solving them. If a dairyman fails to carry out instructions it is certain that something is wrong. It may be with the supervisor or it may be with the dairyman. It may be a failure of the supervisor to sell the idea of the necessity of compliance or it may be his failure to properly instruct the dairyman; then, again, it may be a lack of intelligence on the part of the dairyman. These angles should be figured out and approached accordingly. Instruction should be intensified and patience exercised when dealing with those who find it difficult to understand easily. This type oftentimes makes excellent producers eventually and care should be taken not to interpret his shortcomings as wilful disregard of authority for a serious injustice might be perpetrated.

A word about actual inspection:

The health officer does and should set the policy of his department, but he looks to his supervisors for the execution of that

policy. He does not wish to be bothered with details, but expects, rightly, his dairy supervisor to have any information that he, the health officer, may be called upon to furnish the state or federal governments or his superiors in the local government. This can be done only by keeping a complete system of records, and this is more important than it would seem at first consideration. It is necessary to have information at hand to secure statistics regarding the dairy industry and under the grading systems, which all up-to-date municipalities have adopted, the record of a dairyman is of prime importance because it is upon that record that his grade is based. Grades cannot be correctly maintained, therefore, without accurate records.

Adopt a system of inspection in the field. A casual visit of the supervisor to a man's premises is not an inspection. Take time. Go through carefully with the person in charge, making suggestions as you go. The average dairyman will appreciate this interest on your part and will feel that you are trying to help by calling attention to the things that will actually improve his product. This is the time and place to give most of your instructions. If trouble is experienced in having any item of sanitation satisfactorily carried out I know of no better method to follow than that of actually doing the work before the very eyes of the person in charge of operations just as you would have it done. A demonstration of this kind is especially valuable in dealing with those of less than average intelligence who find it hard to comprehend oral instructions.

A duplicate record should be made of such inspections, including notations of any special instructions given at this time. It is well to have with you on each inspection, in an indexed file, a record of your previous inspection. This precludes any misunderstandings that might come up regarding previous instructions.

The inauguration of proper methods is *the* important thing in milk production. A certain amount of equipment is necessary, but it is not how much equipment one has but *how it is used* that produces good milk or fails to produce good milk.

This important thing should be remembered: All our efforts toward securing safe water supplies, sewage disposal systems, sterilization of utensils, clean barns and milkhouses and up-to-date methods are of no avail if we do not have *healthy cows*. This is a phase of dairy supervision which has been sadly neglected, and is the weakest link in most of the systems I have had the opportunity to observe. Physical examination of the herds is of paramount importance and can be properly done only by a veterinarian. This is the reason, and a good one, too, why some municipalities employ only graduate veterinarians for this work.

Milk is subjected to much unjust criticism. No matter how many articles of diet an individual has eaten, if milk was included in that diet and sickness results milk will be blamed. It is strange that this should be the case, but nevertheless it is true and is an echo of the days when milk production was not supervised and pasteurization and many other safeguards that are now thrown about the product were unknown. When these criticisms are voiced the supervisor should take immediate steps to ascertain the truth. This is most important from the viewpoint of the public and vital, also, from the standpoint of the distributor. For the former it means a life jeopardized and for the latter possible bankruptcy. At this point the responsibility of the supervisor and health officer is great. Extreme care should be taken not to jump at conclusions, but if a milk supply is proved to be polluted I do not believe any dairyman would want to distribute it and certainly no health officer would permit it. On the other hand, if it is determined that the product is innocent of the charges against it, then the health department owes it to the particular distributor concerned and to the industry at large the protection it can give by dissipating in the mind of the public the idea that the product is dangerous and thus haul down the red flag of suspicion which has been raised by idle rumor. Every rumor of this sort cuts down milk consumption and thwarts the aim of every conscientious health official.

The Base and Scope of Animal Hygiene*

PREVENTIVE medicine and hygiene cope with disease before it appears. In spite of all that we can do there will always be a disease problem. The quality of morbidity is inherent in biology. Disease is a tool in the hands of nature to right wrongs. Nature cares not a rap for the individual but is zealous of the species. Animal species outbreed the food supply and, if unhindered, the species is in jeopardy. Disease is used by nature to correct the hazard. It destroys thousands and the species is saved from starvation.

We should seek a background for our work in the study of disease in nature. We find wild animals suffering from disease. We don't see it easily, and we often hear it stated that wild animals do not suffer from disease, but they do. You will find it if you look for it. In domestic animals there is far more disease than there is in wild animals. The higher morbidity rate in domestic animals cannot be questioned. In domestic animals we have taken away some of the protection that surrounds wild animals.

The tendency to variation is inherent. When changes occur to which the species cannot adapt itself, the species is doomed. In the records of fossils, we are shown that countless thousands of species have existed and disappeared for just this reason. When changes in its environment occur faster than the species can adapt itself to the new conditions, it disappears.

Our domestic animals possess the same capacity for adjustment to changes in nature that wild animals possess. They possess in greater degree than wild animals, the ability to adapt themselves to changes brought about by man.

Go to a zoological garden and see the effect of man made changes on animals taken out of their natural environment. They become sterile and suffer from homesickness almost immediately. Adaptations are slowly evolved. Ecologic disturbances and morbidity go hand in hand. The causes of disease from outside are far more numerous than causes from within.

Mountain sheep, buffalo and antelope, elk and other herbivorous animals ranged for countless ages over our western plains and forest preserves without material harm from poisonous plants, but these same plants are very destructive to cattle and sheep on these same ranges. It has been assumed that the wild animals avoided these plants instinctively and domestic animals do not have the same instinctive aversions to them. This may be true to some extent, but it is not the principal reason that wild animals survived where domestic animals succumb.

If sheep are driven across a poison plant range containing death camas, for example, four or five thousands of them may be grouped together and they are driven along more rapidly than they would progress if allowed to go by themselves. It is natural for a sheep to eat as he walks. The animals in a large band eat up the grass and other wholesome forage that is available before those at the tail of the band reach it, and when they come along only poisonous plants are left. They eat them with heavy loss. The same animals could be driven across the same range without harm if they were not crowded, were given ample time and allowed to spread out so there would be a little bit of grass for all.

Some years ago, I went into Western Nebraska to study a disease of horses. Locally, it was called walking disease. Some investigation of this disease had been made by local veterinarians and range owners, for years. The first thing I did was to make a survey to find out where the disease occurred, when it occurred and how frequently it occurred, etc.

I was impressed in the beginning with the fact that the evidence pointed to it being a plant poisoning. It didn't have the earmarks of an infectious disease. This was very unsatisfactory to the farmers. What they wanted, almost as much as they wanted to know about the disease, was to have a new

*Notes from an address by L. Van Es, Department of Animal Pathology and Hygiene, University of Nebraska, Lincoln, at the Sixth Veterinary Conference, Ohio State University, Columbus, March 18-20, 1931.

disease, particularly they wanted a new name. When I stated that I didn't think it was new or infectious or parasitic, they took me to task rather severely and I remember one old ranger, a keen observer, told me that the disease was undoubtedly new, that he had lived there since pioneer times, that he had seen the disease only within recent years, that the range was just exactly as it was 50 years ago. The same plants grew, the rain fall hadn't changed. The horses grazed in the same place they grazed when the old ranger first moved into that country. He affirmed that the horses, the range and all conditions were the same, but now they had a disease that they didn't have formerly. Therefore, it must be a new disease and, because many horses in a herd were affected, it must be infectious.

Well, it pays to listen to these old fellows. Often you will learn something. He had put a problem up to me. It seemed that I had to find out something new on that range or admit that his reasoning was logical, and so I spent considerable time out on the range, inspecting it, classifying and collecting the plants that grew there and noting everything else. And, suddenly, I noticed that the range was all fenced. One could travel but a short distance in any direction, at most only a few miles, without coming up against a fence, and so I went back to this old ranger and told him I had found something new on his range. He didn't believe it. And then I asked him if the wire fences had always been there. He said: "Of course not, but the horses don't eat the wire fences." I told him that nevertheless that was just the explanation, that under natural conditions when one range was depleted, the animals moved on to another; but when the range was fenced, they couldn't move on, they had to stay right there, and when all the grass and plants that they would naturally eat were gone, they had to eat others, and doing this, they had eaten a plant that was causing the trouble.

Further investigation confirmed this and identified the plant. The thing that made the problem obscure and had fooled the ranger was the fact that it was several weeks or months after the animals had eaten the plant before they were visibly affected by it. Such is the explanation of nearly all plant poisoning in animals. Poisonous plants are eaten because other plants are not available. Fences deny the animals the adjustments that nature has provided.

Man has set up more ecologic changes for himself than he has for animals. On coming out of trees, men began to exchange their bugs, lice and worms with one another. Going into houses and other habits of gregariousness gave him tuberculosis. Such a useful and comfortable thing as window glass gave him rickets. It is only his superior ingenuity that has enabled him to survive at all.

Take the horse, undoubtedly the most perfect of all biologic products, perfectly adapted for grazing, a digestion perfectly adapted for the food obtained by grazing, a locomotary arrangement that enabled him to reach his feed and escape his enemies, all admirably adapted to his survival in nature. Then man came along and captured him, probably as a colt. Soon man learned that he was useful in getting about from place to place, perhaps for stealing women, and then he found that he was useful to carry man's burdens. As a result of these varied employments, he hadn't sufficient time to graze and so man had to provide concentrated food for him—to grow grain. The horse was required to travel so much for man that his hoofs did not grow fast enough to protect his feet, and man, the animal who could think and use tools, made horse shoes. The horse is not adapted to these new conditions. His digestive apparatus was not designed for concentrated food, and colic results. The disasters in our zoological gardens and on our fur farms are just so many more illustrations of the inability of animals to adapt themselves to ecologic factors imposed upon them by man.

A few years ago, a man came into our laboratory with a package and announced that he was a muskrat farmer. That was something new to me, at that time. The man stated his rats were dying with coccidiosis. I explained to him that it was a filth-borne disease. He assured me I was wrong, because he employed excellent sani-

tary measures on his farm. Thinking the rats would like water to play in, he had made a concrete pool, far more sanitary than a mud pool, such as a rat would play in in a swamp, but he overlooked the fact that in the swamp the muskrat population would be sparse and the coccidia that any

L. Van Es

of them eliminated would be sparsely distributed. Few of them would be picked up by other rats. His concrete pool had brought all his rats together for play in a very limited area, with the result that they obtained massive doses of coccidia, and were dying from coccidiosis.

Nagana makes animal husbandry practically impossible in a large area in Africa. Game animals are able to exist with the parasite, but imported animals, that haven't made any arrangements with the trypanosome, succumb. Then cattle plague came in with the imported animals from Asia, and all the large, native, herbivorous animals, over wide areas, died. At once the country was safe from nagana for all domestic animals. In killing off the game animals, the natural reservoir of the trypanosome cattle plague, had killed off also the trypanosome.

In pioneer days, malaria was very prevalent over great areas in this country, in regions where it doesn't occur at all now. The mosquito is still there, but the malaria parasite is gone, and this is the explanation: The parasite was entirely dependent upon human beings. In pioneer days, no screens were used, and there were few animals available for the mosquito to live on, hence they attacked man, and the man was attacked by malaria. As screens came to be used and as large numbers of cattle and horses were kept in close proximity to human beings, the mosquito found it much easier to live on the blood of cattle and horses than on human blood, and probably in time came to prefer it, but this was very bad for the malaria parasite, and it has disappeared from many such areas.

The death rate from tuberculosis in man has been cut down more than 50 per cent, and is still being lowered; but it doesn't mean that the tubercle bacillus is gone. The tubercle bacillus has just as good a chance to survive as man has.

Take typhus, for example. We had almost forgotten there was such a disease among highly civilized people until the World War came along and made the world safe for lousiness; then thousands died of typhus, and had it not been for delousing stations and sanitary measures employed by the medical department of the army against typhus, it would have killed far more soldiers than bullets did.

The modern dairy cow illustrates a variation by selection and its effects. Her great udder has outgrown its natural protection. It is a veritable touch-me-not. Caring for it is a constant effort. It depletes the whole system and renders the whole animal more susceptible to disease.

Primitive man thought disease to be of supernatural origin. Incantations and magic were resorted to for its prevention or cure. Modern medicine can be dated from the invention of the compound microscope. When we can see a thing, we can understand it.

The contrast between man's methods and nature's methods is the contrast between the individual and the species. Human effort is directed to saving the individuals. Nature cares naught whatever for individuals, but is interested in the salvation of the species.

Hygiene is indispensable to our civilization.

Bacteriophage*

BACTERIOPHAGE has come in for much attention in the past two or three years. However, the subject is not a new one. It had long ago been noted that something happened to many colonies of bacteria that were grown for any considerable period on the same media.

Doctor de Herelle, in 1908, discussed this subject, and in 1916 discovered what he thought was the solution. He noted that the filtrate of a stool added to a broth culture cleared it over night. Many have noted this phenomena since, and the literature on it is voluminous.

The isolation of a bacteriophage is made usually from stools or sewage. When it is added to a young culture, the culture grows for five or six hours, and then begins to clear. In a few hours it is clear, and it is then filtered and the filtrate constitutes the bacteriophage. It is not always so easy to prepare, however. Sometimes the process must be repeated several times, and the bacteriophage thus concentrated until 1 billionth of a cc. will promptly clear a broth culture.

The bacteriophage is not strictly specific. For example, if one has prepared a phage for *Bacterium coli* and wants to use it on *Staphylococcus aureus* he has to make one or more successive filtrations, inoculating the filtrate into young cultures of *Staphylococcus aureus*. At first the phage will not act on the *Staphylococcus aureus* culture, but quickly becomes adapted to it.

It cannot be said just what a bacteriophage is. de Herelle called it a living organism, but others think he has not proved the point, and maintain an open mind as to whether it is a living organism or an enzyme. There is no good accepted theory on the subject.

Boils and other pyogenic infections seem to respond more readily to treatment by bacteriophage. The method of treatment is to cover them with gauze soaked with the bacteriophage. Inoculation into the area of infection has been used, but this is painful and produces no better results than the external application of the bacteriophage in a wet dressing.

The immediate relief from pain when this dressing is put on a boil is striking, and in a short time evidence of the infection either disappears or the evolution of the infection is hastened. The discharge which is a thick pus becomes thin and is easily evacuated. The process proceeds to prompt healing.

An instance of what may sometimes be accomplished with bacteriophage is shown in the case of a five-month old boy who was treated with it recently by Dr. Rice. The child had between 200 and 250 boils on his body. He was unable to sleep, and was running a rather high temperature. In 24 hours after a wet dressing of bacteriophage was applied all over the body, he was feeling well, eating and sleeping normally. In eight days only two boils remained and he was discharged, well, in 23 days from the first application.

Another case was a woman with a large abscess 15 inches in diameter over the shoulder, also reported by Dr. Rice. It was discharging 250 cc. of pus daily. This case was seen by a number of prominent physicians, all of whom pronounced the case as incurable and certain under ordinary treatment, to terminate fatally in a short time. It was dressed with bacteriophage, and the patient felt better in three hours. In a week the abscess was reduced to one-third of its former size, and in 45 days recovery was complete.

The results are not always so good as in the foregoing cases—sometimes it fails. There is much about it that is not known, but the results are very encouraging, and at this time justify the adoption of this treatment by everyone engaged in the healing art.

*Notes from an address by G. I. Wallace, Associate in Bacteriology, University of Illinois, Urbana, at the Twelfth Annual Illinois Veterinary Conference, University of Illinois, Urbana, February 10-12, 1931.

Reducing Losses Caused by Worm Parasites of Livestock

By E. M. NIGHBERT, Washington, D. C.
Extension Veterinarian, U. S. Department of Agriculture

THE important activities in worm parasite control in animals are those of sanitation, medication, management, provision of farm equipment, and proper feeding. Owing to the varying aspects of the presence of internal parasites, veterinarians, farmers, and stockmen have not been generally aware until recent years that worm parasites are developing to such an extent that they are a major animal-health problem in many states and localities.

Sanitation and proper medication are the most important means through which worm parasites may be controlled. Good management and the use of suitable farm equipment are aids, and proper shelter and feeding are essential for obtaining normal growth and development of animals. Good farm equipment in the way of suitable fields, well fenced, enables the farmer and stockman to carry out a rotation of crops and pastures, and provides premises on which to handle animals with the view of controlling internal parasites.

Animal parasites take their toll in the way of work, meat, milk, eggs, wool, mohair, and such animal by-products as leather and sausage casings. Young animals are especially susceptible to the bad effect of parasitic infestations. Growth and normal development of infested animals are hindered, both requiring more time and feed for the animal to reach the stage of maximum profitable use. Parasites cause, in the aggregate, the deaths of many animals, but death of a number of animals at any one time and in any one flock or herd is the exception and not the general rule. Parasites do not attack singly; they operate in mobs and are nearly always found as mixed infestations. In a single pig as many as a dozen or more different kinds of worms may be found. Parasites in their attack do more than infest; they wound the tissue structures and leave in their trail openings for bacterial invasion, and they load the hosts' systems with toxins.

Parasites of different species and in different stages of development invade the blood stream and may be found attacking every vital organ or moving about in the body cavities. Some forms may be found in the brain and eye of animals. Some parasites, in order to reach the host animal for development and reproduction, may take a circuitous route through some temporary intermediate host, and the finding of these hosts makes research in the study of life cycles slow and difficult.

Parasites work quietly but effectively for weeks and months, unobserved by the stockman. Usually there is no fever in wormy animals unless complicated with other conditions, the outstanding symptoms being unthriftiness, runty conditions, diarrhea or constipation. Of course, inferior breeding, underfeeding and improper management may be the cause of unthriftiness; however, investigations show that some kind of internal parasites may be found in almost every animal on which a post-mortem examination is made, and this is evidence that animal parasites may be present in every herd and flock in the country.

Worm parasites multiply and fortify themselves best where there are the most animals, and take the greatest toll where the livestock industry is the most valuable and has been long established. This

is the visual picture of the parasite problem.

The Zoological Division of the Bureau of Animal Industry of the U. S. Department of Agriculture is the principal animal-parasite fact-finding organization of the government. Cooperation on the part of states and individuals doing similar work has been of great value in helping solve the complex problem of the study and control of animal parasites. This cooperation is not only solicited but is gladly received and welcomed at all times.

When the Zoological Division and the state forces or individuals find the facts concerning parasites as to life histories, nature, and habits, the next step is to devise sound plans that may be applied through proper methods of dealing with the problem. All methods of dealing with parasite control are based on the life history of parasites and a control method must pass through a series of critical tests before the plan can be made use of in a practicable way.

The prevention and control of animal parasites may be accomplished in two general ways, viz.: by suitable medication properly administered and by sanitation methods. Sanitation includes the rotation of livestock to new fields. The rotation of stock on pasture should be practiced. For example, premises may be used by horses, cattle and swine in rotation. Premises used by sheep may be used subsequently by horses and swine without danger of the parasites of one infesting the other, as a rule. Important parasites of sheep, goats, and cattle are exchangeable among these hosts; therefore, the rotation of premises with these classes of animals is not advisable. While complete eradication of worm parasites would be very desirable, at the present state of knowledge concerning them, practical measures of prevention and control to hold them at a low level will have to be relied upon at this time in dealing with the problem.

When the facts have been ascertained as to life cycles, and when control measures have been worked out and critically tested by the research worker, the next step is to pass the information and facts to the veterinarian, farmer, stockman, and poultryman in order that they may apply them and that the livestock industry may thus be relieved to some extent of the parasite burden.

At this stage the Zoological Division and its co-workers act in an advisory and demonstrative capacity. The main burden of making use of the information must pass on to other organized forces and individuals. The veterinarian, through his education, training, experience, and daily contacts, is the person qualified to make a diagnosis and direct medication, and to have a working knowledge of prevention and control measures through sanitation methods.

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The extension forces of the country, through their training, education, and experience, are the advisory agents as to sound farm practices and management through whom wide dissemination of information concerning parasite-control methods is carried out.

The veterinarians of the state, the extension forces, farm bureaus, and colleges of agriculture of the various states are the agencies that will put over the parasite-control program through organized effort.

The purebred livestock breeders, livestock associations, farmers, stockmen, and poultrymen are all interested and may be brought into a cooperative campaign to control parasites, thus making the livestock industry more profitable and useful. The Extension Service will be glad to aid any organization or state in a local or state-wide movement to control animal parasites.

Clean Milk*

THE dairyman's business is to produce milk. Breeding is purely incidental to milk production in the dairy industry. The highest quality of milk is that freshly drawn from a healthy cow. The dairyman's and a milk distributor's job is to keep up this high quality as long as possible.

Dairy equipment is largely a collection of junk for the contamination of milk. We keep handling it from the cow to the consumer and making it worse and worse all the time. Fifty to 60% of the farmers produce good milk. An additional 30 to 40% can be told how to produce clean milk and will do it. Only about 5% of the dairymen are unable or unwilling to use the necessary care to produce clean milk. One way of expressing it, is to say about 5% of our milk producers God never intended to be dairymen.

Producers of milk should take a pride in their produce and guarantee it and not have to be forced to keep it clean. Two bad conditions in milk are odors and flavors, but far more important are bacteria. In fact, the struggle to produce clean milk is in a very great measure a battle with bacteria. Three parties are concerned in this, the producer, the distributor and the consumer. You would be surprised to see, unless you investigated the matter, what the family that uses it can do to milk, and how quickly they can take a Grade A milk and transform it into a Grade X milk.

The dairyman's job is largely to keep bacteria out of milk. The udder is one source of bacteria in milk, but not much can be done about it. In fact, nothing can be done, other than to watch for cases of mastitis and keep the milk from such cases out of the general product. Another source of bacteria is the surface of the cow and the surroundings. The surface of the cow contains enormous numbers of bacteria. It is impossible to produce clean milk from dirty cows and it is impossible to have clean cows in a dirty barn. The third, and probably the most important source of bacteria in milk is the milk utensils.

Milk Utensils Most Important Source of Bacterial Contamination

Over and over again we have examined utensils and found them teeming with billions of bacteria. Again and again we have seen the farmer pour a Grade A milk into a can and by that act transform it into Grade C milk. When an empty milk can stands by the road side or by the milk house with a cover on for half a day, no matter what was done with it at the creamery or pasteurizing plant, it is just louzy with bacteria. We have found 50 billion bacteria in an eight-gallon can standing at the milk house door. Eight gallons of sterile milk poured into that can at once contains nearly 800,000 bacteria per cc.

It is one thing to know a condition and another to correct it. One practice in the production of milk with a low bacterial count is very, very important, and that is simply old fashioned airing and drying of the milk cans and other utensils. I took six cans that had been sterilized under steam pressure and put a teaspoonful of rinse water in each can. Three of those I kept covered for 24 hours and three were left open. After 12 hours the three cans left open contained an average of three million each; the three covered cans contained an average of eight billions organisms each.

So, we have the three sources of bacteria, the one from the udder, about which the dairyman can do very little; the surface of the cow, which is important and which he can control to a large degree; and the utensils, which is a more difficult task to handle than the cow but still can be controlled. We need not bother about what might fall into the milk as the farmer carries the milk from the cow to the strainer. It would not amount to 5 organisms per cc.

Another measure in the control of the dairyman is the temperature at which he keeps his milk. Fifty-five degrees F. is

*Notes from an address by M. J. Prucha, Professor of Dairy Bacteriology, University of Illinois, at the Twelfth Annual Illinois Veterinary Conference, University of Illinois, Urbana, February 10-12, 1931.

about the crucial temperature for milk. Above 60° the bacteria increase rapidly; below 50° they increase very slowly. The bacteria in milk that come from the udder are very tender organisms. They are used to living in the udder at approximately blood heat and their development is easily stopped by cooling the milk even a little bit. Even at 70° the growth of such organisms is unimportant. So the dairyman that keeps his milk clean after it comes from the cow has by that act solved the problem of cooling.

The outside germs, on the other hand, grow at almost any temperature, and at a temperature above 60° they grow rapidly. To control these the milk must be cooled to 55° or lower and cooled promptly.

The "Technique" of Keeping Milk Clean

Keeping bacteria out of the milk is to a considerable extent the result of a correct technic—that is to say, of a number of little tricks and stunts that the farmer does not think of nor know how to practice until he is told. Clipping the cow's udder, keeping her and the barn clean so that dust cannot fall into the milk, using utensils free from seams and rough places, rinsing his milk utensils first with cool water, then scrubbing with warm water, good washing powder, and a good stiff brush, and finally rinsing them in clean boiling water. Then airing should follow. Don't forget that. There is always some mositure left in the vessels and some bacteria. They will grow if covered and kept moist. They will stop growing if the utensil is aired and dry.

I have seen testimonials from many dairymen, who after they were shown these little tricks and stunts, were able easily to produce Grade A milk with no additional cost, where before they could produce only Grade C.

Good Milk Requires No Selling

On the whole, the producer and distributor have a long way to go to produce a clean milk that the consumer likes, but when they do that, they will be amply repaid for it by the enormously larger market for their milk that they will have. Whenever consumers have an opportunity to get clean milk and learn how good it really is, their use of it increases, and keeps on increasing.

SANITARY MILK PRODUCTION*

By far the greater percentage of milk producers hope to produce good milk. It is only necessary to tell them how, to get them to produce good milk. I believe that the veterinarian is the logical man to do this. For the production of desirable milk, it is fundamentally necessary that only healthy cows be used and, of course, the veterinarian is the only one to make the examination to ascertain the health of animals.

Starting with a healthy herd and an owner who desires to produce good milk, it but remains for him to have the right kind of equipment. These things, the healthy herd, proper surroundings and the right kind of equipment, should be provided for in regulations, but the regulations must be enforced with an understanding of the background.

The necessity for clean milk, clean animals, separate milk houses, barns cleaned daily and manure removed to where cattle have no access to it; the equipment rinsed in cold water, scrubbed with a brush in warm water to which a scouring powder has been added, rinsed in hot water and the milk cooled to 50° F. at once, are the essentials to a clean product. Milk so produced sometimes brings an extra price. Borden's pays a premium for milk delivered to their plant with a bacterial count of less than 25,000 per cc and an additional premium for milk containing less than 10,000 organisms per cc.

When the milk is delivered, the temperature is taken, the cans inspected and a sediment test made. The counts are made by the plate and direct microscopic methods. The plate method is satisfactory for milk containing 100,000 organisms per cc, but the direct microscopic method gives more information and is more desirable.

The veterinarian is the logical man for a dairy inspector. Last year, two veterinarians in the United States were voted the most useful citizens of their communities. It is noteworthy that both of these veterinarians were engaged in milk inspection as a part of their duties.

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*Notes from an address by H. Paul Gray, Borden's Farm Products Company, Chicago, Illinois, at the Twelfth Annual Illinois Veterinary Conference, University of Illinois, Urbana, February 10-12, 1931.

"Technique" in Veterinary Practice

By H. B. TREMAN, Rockwell City, Iowa

Bovine Obstetrics

Downers.—Frequently in bovine obstetrical work we find a cow that is unable to or cannot be made to rise to her feet. If we also have a presentation that requires the repelling of the fetus to correct the dystokia it is practically impossible with the cow in a recumbent position. In such cases I have found it most expedient to raise the posterior quarters by means of a block and tackle attached to the hind legs and suspended from a beam or rafter. In this way the parts can be raised until the vulva is two or three feet above the floor, when the fetus can be repelled and will stay repelled until the dystokia is corrected. Also this procedure makes it comparatively easy to replace a prolapsed uterus. While this method is no doubt very commonplace to many men, I have found many practitioners who have never used it. I have never known of an injury to a cow as a result of having been lifted in this way.

Embryotomy.—Since the fetatome has become popular embryotomy with a knife is not often necessary but at times it must be resorted to. The best knife I have used has a plain hook blade, similar to a Miles' castrating knife, with a hole in the handle. With this I carry a piece of number nine wire, which has a short hook on one end and a good sized loop in the other end for a handle. With a pair of pliers the short hook can be firmly attached to the hole in the knife handle and we have about a thirty inch extension on the knife. With this arrangement the cutting blade can be carried to any part of the uterus and can be rotated at will or be drawn toward one to effect the cut.

Teat Surgery

Hard Milkers.—If I had started using a Stoll's teat bistoury or something similar twenty-five years ago in my territory I would now be making many more calls to relieve hard milkers. I have only been using that method a few years but it is already becoming very popular among my clients. The only disagreeable results, if strict asepsis is practiced, are that once in a great while we get a leaker or an occasional teat that sprays when milked. However, the great satisfaction to the owner in so many cases far more than makes up for the few unfavorable ones.

Teat Suturing.—I believe in a former article I described a method of sewing teats that have been cut or torn directly into the teat canal. However, I feel that it is of enough practical value to justify a repetition. While this class of teat injuries is not common yet they are met with from time to time and must be handled in the best manner possible.

Of course the first thing to do when the milk duct has been opened is to give the wound a very thorough cleansing as this goes far toward keeping down subsequent infection. Then the inner half of the wound through and including the mucous coat is sutured with small interrupted catgut sutures, which are then buried with a row of interrupted linen sutures through the skin wound. The next step consists of cutting the sphincter at the end of the teat by means of the large size Stoll's teat bistoury. It is important that the teat be slit sufficiently to allow the milk to almost run out of its own accord for several days, which not only lessens the danger from infection in the quarter but gives the teat wound a good long time in which to heal before any milking manipulations are necessary.

Many veterinarians seldom carry catgut but in my experience it has been well worthwhile even if only for the few cases of wounds one will run across.

Button Sutures

Another simple but very valuable article I never aim to be without is a supply of ⅝ to ¾ inch bone buttons, preferably the kind having only two good sized holes in them.

These I find most convenient for supporting sutures for large cuts or tears and also for suturing the vulva when that job is indicated. Extra heavy suture material on a self-threading needle is used to insert the stitch using the suture material doubled. The needle is then removed and the doubled end of the suture is run through one hole in the button, back through the other hole and the button is then put through the loop in the end of the suture, which secures the button number one. Then the two free ends of suture on the other side of the wound are run through the two holes in button number two and the stitch is adjusted to the proper tension and held by an ordinary square knot. This stitch holds much longer than even a tape suture because the strain is so largely on the surface of the button itself.

Ether and Oil

Ether and oil in the proportions of two or three ounces of ether to one quart of mineral oil has been recommended for various conditions, especially in retained placenta in cows and obstetrical troubles in sows. I have not been especially pleased with this treatment except in sows but it seems of great value there. Frequently we are called to sows that are apparently not through farrowing, yet there are no pigs within reach of long forceps and caesarean section is contra-indicated for various reasons. In these cases I have often given the sow a good uterine douche of from a pint to a quart of the ether and oil and in many cases the sow will give birth to one or more dead pigs within twenty-four hours and then make an uneventful recovery.

Substitute for the Cattle Noser

In applying the TB test or in vaccinating nervous cows, did you ever have the owner, instead of nosing them, just step in front of them and slap the animals very vigorously around the nose and eyes? Just try it some time. I think it works better than nosing and they do not usually bellow and excite the rest of the herd as much as when the noser is used.

A Convenient Small Animal Operating Table

The practitioner who cannot afford an expensive canine operating table, or who perhaps hasn't the room for the ordinary table, can construct a very satisfactory substitute with but very little expense. A good 1⅛ inch board, sixteeen to eighteen inches wide by about five feet in length and finished on both sides makes a very good top. A tinner can easily make a galvanized iron cradle about sixteen inches long by seven or eight inches in width, which is equipped with a small bolt in the bottom of each end to fit into holes in the table top or can be lifted off when the flat table is wanted or when the table is hung up for the night. One end of this table top is then hinged to the top of a 1⅛ inch strip about eight or ten inches wide and a little longer than the width of the table top. This strip of wood across the end of the top is now fitted into an improvised iron slide on the side of the wall so that this end of the table can be raised and lowered in the same manner as an ordinary barn sash. On the other end of the table top a leg or legs is well attached and firmly braced, this leg being of the right length to bring the table to the proper height.

The bottom of the slide on the wall is so placed that the table when resting in the bottom of the slide and on its legs will be about level. When it is desired to have it at an angle the end in the slide can be raised to any desired height and for all ordinary work will remain at whatever height is wanted. When not in use the table is first placed in the level position and the end with the leg attached is raised up and over against the wall, and inside the frame of the slide. Thus the table takes up only its own thickness on the wall and the leg is up parallel with the ceiling and out of the way. A few coats of white enamel and you have a very workable small animal table which is far from unsightly.

An Equine Blindfold

I dare say there are comparatively few practitioners who use a blindfold regularly when operating upon or otherwise treating equine patients. If you will try it I feel

sure you will want one on hand as regular equipment. It is of course especially indicated in castration whether it is a standing operation or not. For many years I made a practice of covering the eyes of an especially vicious colt by using a sack, jacket or anything handy. Finally it dawned upon me that if it would make the bad colts good, why would it not make the good ones better, and so it does. Instead of watching your every move and becoming frightened while being harnessed or treated, most of them will stand quietly.

A very convenient blindfold can be made of suitable canvas or other material, even the leg of an old pair of overalls will do in an emergency but such should not be used regularly. It should be about ten inches wide and two feet long with the ends gathered in with a buckle on one end and a strap on the other. A blindfold of this kind is most convenient to carry and if it is a part of one's regular equipment one finds it very useful, times without number.

THEORIES OF DISEASE*

The fundamental purpose of studying the pathology of any condition is to get a better understanding of the disease or condition.

Disease is a process due to the interaction of two forces, the injurious agent and the defensive forces of the body.

Disease of the body is a natural phenomena just as it is a natural phenomena for fire to burn and water to freeze.

A lesion is a composite picture of the interaction of two forces, the injurious force and the defensive force. We can usually see in a lesion evidence of both forces.

The nature of disease has been a matter of speculation and study since the dawn of recorded history. In the time of Hippocrates, a theistic theory of disease was generally held. That is, disease was thought to be the evidence of displeasure of the gods. Many other theories as to the nature of disease have been held at various times and then given up.

Later, the humoral theory came to be held, at least among scientific men and it dominated medical thought for 2,000 years. It still exists in the minds of many laymen. According to the humoral theory there were four humors, blood, phlegm, black bile and yellow bile and disease was due to a lack of balance.

For centuries but little advance was made because for a long time the human body was held to be sacred and was not dissected. Such progress as was made was as a result of the dissection of animals. Galen gained his large store of anatomical information as a result of dissecting pigs. A second reason for the slow progress in medieval times was the lack of compound microscopes.

The discovery of the compound microscope by Leeuwenhoek in the seventeenth century gave a great impetus to learning and particularly to the progress in medicine. Notwithstanding it was 200 years before the cellulistic theory of disease came into general acceptance. Cellular pathology made rapid progress and readily supplanted the humoral theory of disease.

Of recent years, serological tests have to a degree restored the old humoral theory but the majority still credit the greater importance to the cellular reaction.

To understand the cellular processes, it is necessary to regard the body as divided into two classes of tissues, parenchymatous cells and structural cells. The latter are especially developed for the defensive role in the phenomena of disease.

There are three groups of these defensive cells: (1) the group whose function it is to build up new structures. From them is developed the connective tissue frame work of the organs; (2) Wandering cells; (3) white blood cells.

From the early development of the human body there has been close relationship between the last two groups.

To the second group is given many important functions in the defensive mechanism against disease, including phagocytosis, antitoxin and immune body formation.

*Notes from an address by E. T. Hallman, Veterinary Department, Michigan State College, East Lansing, at the Special Course for Graduate Veterinarians, given under the direction of the Department of Veterinary Science, University of Missouri, in cooperation with the Missouri Veterinary Medical Association, Columbia, January 20-23, 1931.

HANDLING AND MEDICATING SHEEP*

The sheepman is the most particular among livestock owners as to how his animals are handled, and the most critical in his judgment of a man who does not handle these animals properly. For a veterinarian to catch the sheep by the wool on the sides or back is to brand himself at once in the eyes of the owner, as ignorant so far as sheep are concerned, and furthermore, the sheep man resents improper handling as tending to pull out wool and misplace and roughen it.

To examine the skin, place the hands flat on the wool near together and then bring them gently apart. This will spread the wool so that the skin may be seen and yet when the hands are lifted, the wool will spring back into place and show no evidence of having been disturbed.

The normal healthy skin of sheep is pink. If it has a papery feel or a yellow tinge or is bluish white, it indicates something wrong with the skin or the animal or both.

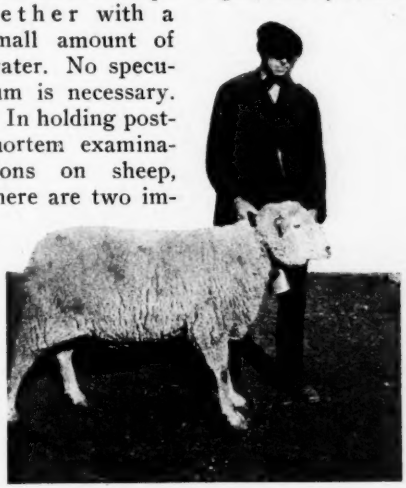
Drenching sheep is a thing that needs to be done with care. If a bottle is used, elevate the nose until the face is horizontal, no higher. Do not raise the head above the level of the back. To hold a sheep for drenching, it is well to stand straddle of the neck with the feet close together. Be sure to drench slowly.

Sheep can be dosed with a stomach tube more rapidly than they can be safely drenched and more rapidly than they can be dosed with a dose syringe. The stomach tube of choice is the one ordinarily used on swine. It consists of a metal pipe about ten or twelve inches long, and slightly curved, with an aperture which is large enough to permit a rubber stomach tube to pass through it.

By standing straddle of the sheep's neck and having the animal backed into a corner, the metal tube with a stomach tube started through it, can be inserted in the sheep's mouth and then the rubber tube passed on to the stomach in two or three seconds.

The dose of copper sulphate solution for stomach worms or any other medication can then be injected into the stomach very quickly and the stomach tube and metal pipe removed. After one has become accustomed to this and acquires some skill with a helper to inject the fluid, a veterinarian can dose sheep for stomach worms as fast as several men can bring them to him. There is no difficulty in dosing 100 an hour by use of the stomach tube.

Some prefer to give tetrachlorethelene in capsules. I prefer to give it with the stomach tube, but if it is given by capsules, the capsule holding attachment on an ordinary two-ounce dose syringe is the best arrangement. The syringe can be filled with water, the capsule inserted in the holder placed well back on the sheep's tongue, and ejected together with a small amount of water. No speculum is necessary.



In holding post-mortem examinations on sheep, there are two important regions that are apt to be overlooked. One is the sinuses of the head, and the other, is the extreme tip of the lung. If you are looking for lung worms, unless the infestation is very heavy, they will usually be found only at the extreme tip of the lung.

A rather peculiar thing is that sheep will get along quite well with lung worm infestation so long as they do not have in addition stomach worm infestation or nodular worms, but lung worm infestations with either of these other infestations causes heavy losses.

*Notes from an address by H. W. Turner, Department of Agriculture, Division of Animal Industry, New Hope, Pennsylvania, at the Sixth Veterinary Conference, Ohio State University, Columbus, March 18-20, 1931.

Cases of Parasitic Otorrhea

By RAYMOND D. WENGER, Columbus, Ohio.

Otodectes Infestation in a Dog

Subject—A dog of the breed Dalmatian, color, black and white. Aged about five months, deaf since birth. This animal entered the hospital of the College of Veterinary Medicine, Ohio State University, February 9, 1931.

Symptoms—Temperature 101.6 F. Hearing impaired. Examination of the external canal, with the aid of an autoscope, revealed the presence of considerable debris and numerous parasites. The ear canal was ulcerated.

These parasites can be seen by the naked eye if they are not covered with debris and the observer looks very closely, but would probably seldom be observed under natural conditions without the aid of the autoscope. This autoscope is so arranged that a light is thrown into a small speculum which can be inserted into the ear canal. At the large end of this speculum is a magnifying glass which magnifies approximately five times, enabling the clinician to make a thorough examination.

A diagnosis of parasitic otorrhea was made upon finding the mite, *Otodectes cyanotes*. The accompanying photograph was taken of these mites.

Treatment—Phenol and glycerin (1-20) was instilled into the ear, on three consecutive days. At this time no parasites could be found.

A fecal examination was made, which was positive for whipworms, hookworms and roundworms. The dog was fasted for twenty-four hours and then given 1cc tetrachlorethylene. Several roundworms and hookworms were passed in the stool.

During this time the ears were being washed daily with alcohol. February 23, the ears were swabbed with mercurochrome. The ears at this time showed very little exudation and were not very sensitive. This treatment was continued and on March 8, appeared to be in good condition.

Otorrhea in a Cat

Subject—A male cat of a gray or maltese color. It had a history of scratching the ears, head and body. This condition had existed for several months. The appetite was good but the cat remained poor and emaciated. Entered the hospital March 3, 1931.

Symptoms—Temperature 103.4° F. Severe inflammation in the external canal of the ears and a large number of mites found present in the ear canals. An ulcer had formed at the base of the left ear which was probably due to scratching it.

A diagnosis of parasitic otorrhea was made with the autoscope, and the parasites photographed, (Figure 4).

Treatment—The ears were cleaned with boric acid solution, and phenol and glycerin (1-20) injected into the ear canal. The ulcer at the base of the ear was treated with sulphur ointment. This treatment was continued daily and on March 9, the cat was released from the hospital.

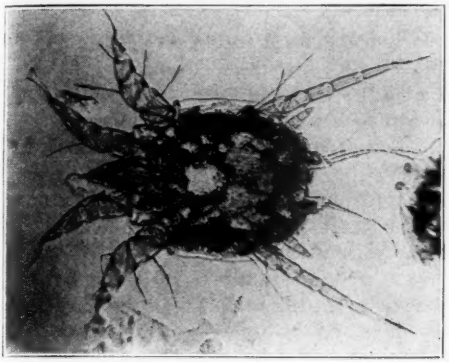
Hemiplegia in a Cat Due to Parasites

Subject—A female cat of a gray tiger color. Was entered in the hospital March 16, 1931. This cat was eleven months old and was unable to get up and down. She had had no use of her hind legs and had been in this condition for about one month. The appetite was good and there was some serous discharge from the nose.

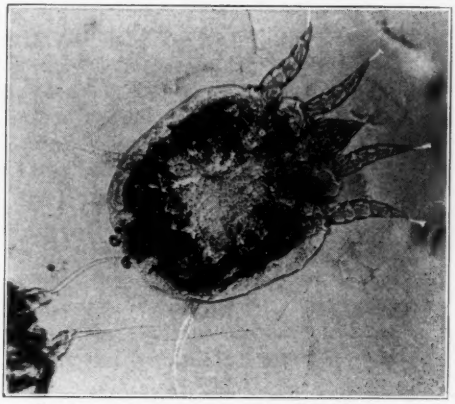
Symptoms—Temperature 101.4° F. Serous discharge from the eyes and nose. The appetite was good. The entire body was tense and rather rigid. The nictitans membrane and the conjunctiva were grayish black. The ears were filled with parasites and debris. This animal was very sensitive at the base of the ears and over the shoulders.

A diagnosis of parasitic otorrhea was made with the autoscope. The patient died before any treatment was applied.

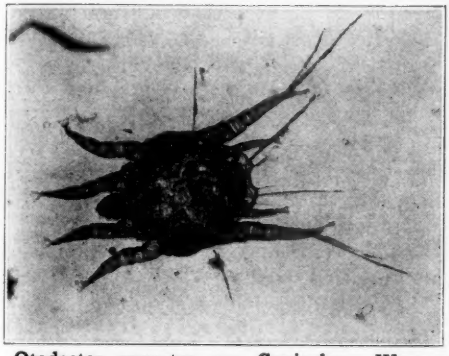
To my mind these three cases point to the fact that parasitic otorrhea may be the cause of a great many more troubles than we have been diagnosing as such. I believe that we should pay more attention to the examination of the ears of the different animals when they have any history of irritations about the head. The last case might not lead an inexperienced person to an examination of the ears as it was so generalized a case as to point to intoxications which are seldom associated with a condition of the ears. I think we are many times too apt to make our diagnosis before we have thoroughly examined our patient.



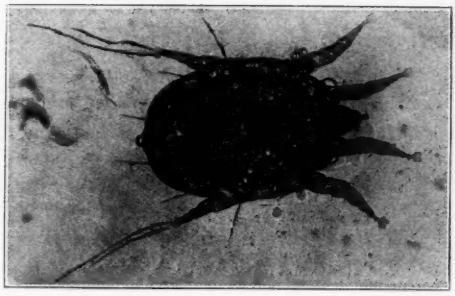
Otodectes cyanotes var. Felis—Wenger.



Otodectes cyanotes var. Canis—Wenger.



Otodectes cyanotes var. Cuniculus — Wenger.



Otodectes cyanotes var. Cuniculus — Wenger.

SOME OBSERVATIONS IN SMALL ANIMAL PRACTICE*

My experience leads me to think that diabetes in the dog is far more common than we have heretofore believed. In fact, I find it to be very common. Meat is the natural diet of the dog, but this animal has a remarkable adaptability to other foods. This leads to his being fed on a wide variety of foods unsuitable to his digestion and his metabolism. Probably to this fact is due the frequency of renal involvement in this animal. When a soft, flabby dog is brought to you with a history of having had a persistent diarrhea over a period of several months, suspect diabetes and you will not often go wrong.

The most obvious thing necessary in most

*Notes from an address by Wm. J. Lentz, Director Small Animal Clinic, University of Pennsylvania, Philadelphia, at the Sixth Veterinary Conference, Ohio State University, Columbus, March 18-20, 1931.

patients is a change of diet. In many cases, that is all that is necessary. In even a larger number of cases, an improper diet is responsible for the condition presented.

Just a word of caution in prescribing a radical change of diet in the dog. Make the change gradually. Give the digestive enzymes an opportunity to adapt themselves to the change in the diet. A single instance of what may happen with a radical change of the diet may be cited. A client of mine was told at a bridge party or some sort of a gab fest, that spinach was good for a dog. She had never heard this before and her dog had never had any spinach. When she returned home, she gave him an enormous feed of spinach and soon afterward rushed him to me suffering from violent convulsions.

When you note the disaster that can be brought about by a single feed of such a harmless thing as spinach, it emphasizes the importance of making changes in the diet gradually.

The most important factor in getting strong, rugged puppies that live is to feed the bitch a meat diet during the time she is in whelp.

No other factor is responsible for so much skin disease, convulsions, etc., as commercial dog biscuits. Dog biscuits are a supplementary feed only. Dogs must have vitamines and for these lean meat alone is not sufficient. The internal organs of animals are richest in vitamines, and tripe, kidney, liver, blood, etc., constitute a necessary portion of a dog's diet.

Recently there was an outbreak in Alaska of what was supposed to be rabies. It was cured by a wise old trapper who fed the animals live rabbits. I believe that even the fur of rabbits or other animals is a valuable factor. As it passes along the intestinal canal, it sort of mechanically sweeps out the mucous and other deleterious products.

In any treatment of eczema, at least a little raw meat in the feed each day is essential. Milk is a valuable feed for young dogs and older animals. It is a valuable supplement.

Fright Disease

If we eliminate from consideration of fright disease all those convulsions due to excitement, to overfeeding, to indigestion, to worms and foreign bodies in the intestine, to exertion immediately after feeding and if we also eliminate idiopathic epilepsy due to nervous instability, we shall not have very much left to consider and we do not know much of anything about what we do have left.

It is not difficult to find evidence to support a theory that there is some specific disease more or less prevalent that falls within the group commonly called fright disease. At the same time, it is no more difficult to find evidence to support a theory that there is no such disease and that the whole group of ailments that the dog owner conveniently terms fright disease can be accounted for by definite well known causes, all of them non-infectious, or the sequelae of such well known infections as distemper.

The cause of convulsions in a given patient are not always easy to determine. I recall a German shepherd bitch that was brought to me. She had recurrent convulsions that occurred periodically and regularly. No cause could be ascertained. She was spayed to see what effect that would have. It in no way effected the recurrence of the convulsions. Then, she was put through a course of treatments to make sure the alimentary canal was free and foreign bodies and parasites, that the digestion was brought into perfect condition, and that the diet was correct in every respect. Still the convulsions recurred.

The animal was destroyed and an autopsy made. Two pieces of oyster shell were found in one of the bronchi. I have no doubt that this was responsible for the convulsions in this animal.

One cannot enumerate all of the causes of convulsions in dogs. I recall a case that was due to a needle in the heart. Mimicry plays a part in convulsions. I have seen eight or ten dogs in a kennel attacked with convulsions, fright disease or what have you, all within a period of ten minutes. These animals were put on an exclusive

milk diet for a few days and milk continued as a portion of the diet. There was no further trouble with convulsions and nothing else was done except this change of diet.

I am consulting veterinarian to quite a number of fox hound packs. They used to have a great deal of trouble from fright disease. I finally convinced them that the trouble was a lack of calcium in the feed and that milk and green bone would supply it, and so in time I induced the caretakers of all of these packs to include milk and green bone in the diet, and from that day to this, there has been no more trouble from fright disease in these animals, and except for the change in the feed, the conditions surrounding the animals are just the same as they were.

I have never seen fright disease in dogs that were fed milk and green bone. There is an infection that may and does occur in kennels that may be mistaken for fright disease. I refer to epizootic meningeal encephalitis. I was called down to New Jersey to a kennel in which there were 235 dogs. The owner thought that about all of them had fright disease. It was certainly prevalent and whether any of them got through the week without having an attack or not, I don't know, but I immediately noticed that many of them were walking on the back of their legs, up practically to the hock in the hind legs and the carpus in the front legs. I immediately put them on an exclusive skim milk diet, beginning after a week to supplement it with raw meat, with very small quantities at first and increasing quantities of the meat later. In three weeks, the change in that kennel was wonderful. Attacks of fright disease entirely disappeared. The animals were walking normally and were improving in condition and appearance.

Coccidiosis

Coccidiosis in dogs is just another result of improper diet. Keep in mind that meat is the natural diet of the dog, that although he can adapt himself to other foods by just so much as you vary his diet from the natural do you reduce his life span and reduce his resistance to disease.

The Johns Hopkins University recently carried on some experiments with coccidiosis in rats. Rats fed largely on cereals and vegetables had a heavy infestation with coccidia. Rats permitted to run with them but fed on milk and meat had almost no infestation. When the whole group was fed on meat and milk, the coccidiosis disappeared from the feces in two weeks

CANINE DISTEMPER*

Distemper in dogs, a disease long known to veterinarians, has attracted much attention during the last few years.

Hutyra and Marek define distemper as: "An acute, contagious, infectious disease of young carnivorous animals characterized by febrile manifestations and an acute catarrh of the mucous membranes which is frequently followed by catarrhal pneumonia, in some cases by the development of nervous symptoms."

In 1905 Carré of France advanced the theory that canine distemper is due to a filtrable virus. His investigation appeared to settle the matter of etiology.

Subsequent investigations (1910-1911) by Ferry in the United States, McGowan in Scotland and Torrey and Rahe in New York not only failed to confirm Carré's findings but seemed to prove that canine distemper is due to an organism now known as the *Bacillus bronchisepticus.*

The matter remained thus until the recent investigation of Laidlaw and Dunkin carried out under the auspices of the British Medical Research Council. Laidlaw and Dunkin state that at the outset of their investigation, they were prepared to accept either view, that of Carré that the disease is due to a filtrable virus, or that of Ferry, McGowan and Torrey and Rahe that it is due to the *B. bronchisepticus.*

However, early in their investigation, they became convinced that Carré is right, that the disease is due to a filtrable virus which occurs in the spleen, brain and other nerve tissues, the liver, lymph glands and

*Notes from an address by A. S. Schlingman, Detroit, Michigan, at the Eighth Annual Post-Graduate Short Course for Veterinarians, Michigan State College, East Lansing, January 26-30, 1931.

at some stages in the disease, in the blood and other tissues.

During the past two years, the author has studied canine distemper, using for the purpose 72 infected animals part of which were obtained from the Detroit dog pound, mostly in early stages of the disease, showing a high temperature, eye and nasal discharges and the usual symptoms by which canine distemper is diagnosed by veterinarians. Susceptible puppies, obtained in the country, and which had had no previous contact with the disease, were also used in this study after exposure to distemper.

The manner of communicating the disease to puppies was always by exposure to an active case of distemper for four or five days.

The *B. bronchisepticus* was recovered from 93% of all the animals affected with the disease, whether they were obtained from the dog pound already infected or whether the infection was due to the exposure of susceptible puppies to active cases under experimental control.

In a few cases a hemolytic streptococcus was found under conditions which seemed to indicate that it was the responsible etiological factor.

The belief is rather generally held that infection with the filtrable virus takes place first and is then followed by *B. bronchisepticus* infection, but in this investigation *B. bronchisepticus* was found to be present on the first day of observable symptoms. In no instance did a spleen filtrate of these animals whether from the naturally infected animals from the dog pound or the experimentally infected puppies, infect ferrets. The results therefore seemed to prove that no filtrable virus was concerned in these cases.

Good results in the treatment of distemper were obtained from the use of an antiserum and a mixed bacterin.

The results of this investigation, which of course requires to be carried further, before definite conclusions can be drawn, and the fact that the Laidlaw and Dunkin treatment gives variable results, seem to indicate that canine distemper, at least as it occurs in the United States, is a symptom complex due to at least three different etiological factors—the filtrable virus of Carré, the *B. bronchisepticus* of Ferry, McGowan and Torrey and Rahe, and a hemolytic streptococcus.

TREATMENT OF FRACTURES*

No fracture in the dog should be neglected because it appears to be simple. Sometimes an artery is injured by the rough surface of the broken bone, and a hemorrhage into the tissue results. Such hemorrhages practically always cause abscesses and sloughing, and may result seriously if a cast is put on the leg and not examined for a couple of weeks.

In compound fractures, and even in the case of a skin wound, although the ends of the bone may not have protruded, the cast or splint must have a window to provide for daily dressing of the skin wound.

Of course, in many fractures there is a tendency for the ends of the bones to overlap. By relaxing the muscles under general anesthesia we may overcome this, but it is apt to recur when the animal comes out from under the anesthetic and the muscles resume their tonicity. Unfortunately, we cannot handle these cases as they are handled in the human. If a man, for example, has an overlapping of the fractured ends of the femur, a weight of sometimes as much as 300 pounds may be hung over a pulley and attached to the leg to overcome the contraction of the muscles. Of course, we cannot do this in the dog, because we can't put him to bed and control him as we do man.

Sometimes the splint can be so arranged as to prevent this contraction of muscles and overlapping of the ends of the bone, but very frequently it cannot be prevented with a splint and we are compelled to permit the bone to heal with the member permanently shortened. Compensation for a shortened leg in the dog, however, is very good. To a considerable extent, the angle of the stifle or elbow is changed and very little noticeable deformity may result.

*Notes from an address by F. E. McClelland, Buffalo, New York, at the Sixth Veterinary Conference, Ohio State University, Columbus, March 18-20, 1931.

One has the alternative in these overlapping bones of resorting to what is termed "open reduction." That is, cutting down to the bone, bringing the ends in apposition and fixing them with wire or kangaroo sutures through holes bored in the bones. Or, they may be held with a metal plate and screws. But, my results from such treatment have not been satisfactory and I advise against it in the dog, and resort to it only when the owner, with a full knowledge of the probable outcome, insists upon this open treatment of a fracture.

Of course, nowadays we see far more accident cases than formerly and it seems to me that in about 25% of these accident cases, there is a coxofemoral luxation. The treatment of these cases offers a great difficulty. The head of the femur may be difficult to get back in place and it is usually difficult or impossible to keep it in place. However, a cast or splint passing from well down the leg up and over the back will usually hold the bone somewhat near to the proper location, perhaps on the edge of acetabulum and usually a new joint is built up by the proliferation of fibrous tissues. This results in permanent lameness, but the animal can use the leg fairly well.

Many cases of dystocia in the bitch are due to pelvic injury and an examination for a deformity of the pelvis is one of the first requirements when a case of dystocia is presented for treatment.

Lateral luxation of the patella is a stubborn injury to treat and the outcome is usually unsatisfactory. The patella cannot be held in position by a cast.

The possibility of nerve injury must receive careful consideration when accident cases are presented. Many of these nerve injuries are hopeless and must be taken into consideration when a prognosis is made. If amputation is done in such cases, the wound will not heal.

In my own practice, I have discarded all sorts of splints except light wooden splints made from basket material. The foot, of course, must always be included in the bandage when a splint is applied and before bandaging the foot small pledgets of cotton should be placed between the toes and a heavier piece of cotton under the foot. After the splint is on and the bandage is in position, it is covered with liquid silicate of soda.

I always remove the bandage and the splint in eight to ten days. This lessens greatly the likelihood of skin necrosis. To leave the bandage in position for a longer time increases the probability of skin necrosis even where the leg has been carefully padded with cotton as of course it should always be padded. Skin necrosis makes a very bad impression upon the owner.

Discussion*

I quite agree with Doctor McClelland in his statements regarding the open reduction of fractures. I usually advise against the open treatment of fractures, that is cutting down onto the broken bone and fixing the ends with wire or a plate and screws.

I recall a King Charles spaniel brought me not so long ago, with a fracture of the femur. I told the owner that we would probably get a fibrous union, a sort of false joint, and such was the result. Immediately after the patient was turned back to the owner, she was discussing the matter with an interne at one of our finest hospitals. He told her that the dog had been improperly treated, that the ends of the bones should have been wired together, and a firm union would have resulted.

The lady brought the dog back to me and I think I have seldom seen anyone as angry as she was. She accused me of everything in the nature of incompetence and negligence, but I declined to attempt an open reduction of the fracture. The dog was taken to the interne and operated upon in the hospital, by a very famous surgeon. Septicemia resulted and the animal died.

I recall another case of a Pom operated upon in a large general hospital because it belonged to one of the surgeons on the staff, and then sent to me to be cared for. In this case, the ends of the bones had been united with kangaroo tendon. Suppuration developed in a few days and after consultation all around, the animal was destroyed.

*Notes from a discussion by W. J. Lentz, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, at the Sixth Veterinary Conference, Ohio State University, Columbus, March 18-20, 1931.

Shipping Fever in Cattle*

THIS condition, or these conditions, have been variously designated as shipping fever, yards fever, stock yards fever, railroad fever, car sickness, etc.

I think that probably neither stock yards nor railroad cars have anything to do with the disease or diseases. It has been observed to occur as frequently and as severely in animals loaded out of pasture, over a new temporary chute into a disinfected truck and unloaded over a new temporary chute into pasture, and not having been exposed enroute to contaminated cars or stock yards.

It probably occurs in every state, surely in all the northern states in which feeder cattle and dairy cattle are shipped. Cattle of all ages are susceptible. Calves shipped just at weaning time seem to be most susceptible and in such shipments the highest percentage of losses occur. The disease is frequently transmitted to native cattle on the farms to which shipped cattle are brought.

The predisposing conditions seem to be, (1) irregularity in the time of feeding, in the amount of feed and in the kind of feed; (2) exhaustion due to the journey and to the handling and driving before the animals are loaded and after they are unloaded.

It has been noted in animals driven rapidly as great a distance as 10 miles before loading, that the susceptibility to this disease is greatly increased. The incidence of the disease is greatest probably in cattle that are shipped into the public market and sold to speculators and by them resold to country buyers. The reason for this probably is that the cattle are given a heavy fill before being offered for sale to the speculators, and after purchases are sorted and classified and then given a second heavy fill before being offered for sale to the country buyers. Such practices with cattle in most instances accustomed to regular grazing in pasture is almost certain to entail digestive disturbances and increase the susceptibility of the animals to shipping fever.

Among the exciting causes of the condition, the bipolar organism, the hemorrhagic septicemia organism, easily stands first. The condition is readily controlled by the use of hemorrhagic septicemia bacterins and native cattle on farms to which shipped in cattle have brought disease, can be protected from the disease with certainty by the use of bacterins.

There is at least one condition, however, that develops in shipped cattle that does not respond to treatment with hemorrhagic septicemia bacterins. The condition is not influenced at all by methods of control that are successful in the handling of hemorrhagic septicemia. In this latter condition the animals have a short hacking cough and the breathing is somewhat heavy. If excited or chased they will fall to the ground and they may die in just two or three minutes.

The animals may not appear seriously affected. I recall a herd of 100 two-year-old range Hereford bulls. Of course, they were wild. An attempt was made to drive one of them into a chute for closer examination and after a short run, he fell down and died immediately. Then an attempt was made to drive a second bull into the chute. He too fell down and although he suffered greatly from dyspnea, recovered. In another herd 12 animals died of exhaustion while being vaccinated.

The affected animals lose condition rapidly. If they live as long as a week, diarrhea is prone to occur. The temperature rarely exceeds 104° F. and is usually about 102° F., or approximately normal.

The disease has been termed pulmonary edema. Perhaps this is a poor name for it, but it does describe the one prominent and characteristic lesion of the condition. The condition is due to a diptheroid organism which undoubtedly produces toxin harmful to the animals. Since the degree of dyspnea is always out of proportion to the amount

*Notes from an address by A. T. Kinsley, Kansas City, Missouri, at the Twelfth Annual Illinois Veterinary Conference, University of Illinois, Urbana, February 10-12, 1931.

of edema in the lungs, the difficult respiration must be due at least in part and probably in major part to the absorption of toxins rather than to the mechanical interference with respiration resulting from the edema of the lungs.

Other than the edema of the lungs, there are but few lesions observable on autopsy. There is usually a transudate under the visceral pleura in early stages of the disease. Where the disease progresses until death occurs, a different picture is seen at autopsy. In such cases there is an dependent edema in the lungs, hemorrhages under the epicardium and into the pericardium. Hemorrhages are found in the lungs also. These are probably the result of the dyspnea.

Not infrequently pulmonary edema and hemorrhagic septicemia occur simultaneously in the same herd and in the same animals. The condition is readily controlled by the use of a bacterin—diphtheroid bacterin, made from the organisms found in the lungs.

Two other conditions cause a loss in shipped animals and are referred to by the cattle men as shipping fever. Both are parasitic. The one an esophagostomiasis and the other coccidiosis, and in both conditions there is a diarrhea and the feces are streaked with blood. It takes laboratory examination to distinguish between the two conditions but clinically it is not necessary to distinguish between them since the methods of handling them are the same.

Animals in which these parasitisms occur were, of course, infested before shipment, but in most instances the infestation was unnoticed and losses did not occur until the animals were subjected to the hardships and exposures of shipping. These conditions are very common in cattle shipped in from the southwest.

Shipping Fever Due to Parasites

The treatment of both conditions, the esophagostomiasis and the coccidiosis consists of a mixture composed of copper sulphate one part, and iron sulphate three parts. Of this mixture two to four drams in capsules or in solution is given each animal, and then this dosage is followed up by giving each animal about one dram of the mixture daily, in the feed.

A useful way to employ it on the feed is to make up a quantity as follows: Copper sulphate 2 pounds, iron sulphate 8 pounds, common salt 5 pounds, and linseed meal 85 pounds. This is sufficient for 100 animals for ten days, and no harm will be done if the dose is doubled.

This condition is one in which the use of the hemorrhagic septicemia treatment aggravates the condition and results in a large loss over a considerable time. These conditions are prone to pile up on one another. That is, in the same lot of shipped cattle, we may find hemorrhagic septicemia, pulmonary edema and one or the other of these parasitisms and sometimes both. The condition is then indeed a difficult one to handle. Uncomplicated, however, any of the four conditions are easily treated and losses from them should be held to a minimum.

FRACTURE OF THE TIBIA IN A HORSE

The interesting and practical report of Doctor Miars of two cases of fractured tibias in horses (VETERINARY MEDICINE, June 1931) serves to recall a similar case observed in Kansas in 1893. The "Cherokee Strip" was opened that summer and some parties who were going through with team and wagon to "make the run" left a young bay gelding with a fractured tibia in the highway. A farmer turned the horse into his pasture and called me to see the case. There was a complete fracture of the right tibia about four inches above the carpus. No treatment was given but the farmer fed and watered the horse and he hobbled around on three legs. A year or more later while driving along the road some miles away I met a boy riding the horse "lickety split." I stopped the boy and found the bone had made a complete union. The tibia, however, was not straight having a decided posterior bend. The boy said it did not interfere with the horse's usefulness although it swung outward a little in traveling.

N. S. Mayo.

Highland Park, Ill.

The Abortion Field Project in Michigan*

THE abortion disease project undertaken in Michigan vitally concerns Michigan veterinarians. We do not think we can control Bang's disease as we controlled tuberculosis, by official veterinarians skipping around and doing the work. We agree with R. R. Birch when he said that to handle Bang's disease the farmer must have close range, specific advice. This, of course, means the local veterinarian. Specific advice cannot be supplied in general terms or by general instructions issued from headquarters.

Education of the cattle owners, as every one knows, played an important part in the success of tuberculosis eradication. It will have to play an even more important part in the control of Bang's disease, and in this education the local veterinarian must undertake an active part.

The name abortion disease has been a most unfortunate one for the farmer. It leads him to think that when he has abortions, he has abortion disease. When he doesn't have abortions, he does not have the disease. He must be educated out of this misconception. It is responsible for the sale of worthless remedies by the car load. In other matters, too, the farmer needs information concerning this disease. For example, dairy owners come to us and want to draw their own blood samples. We tell them that taking blood samples is only incidental in handling the disease, and while they may be able to do it, many other things also are necessary that they can't do, and it is better to turn all the work over to the veterinarian.

The veterinarian must impress upon the farmer that Bang's disease is characterized by:

1. Abortion.
2. Retained placenta.
3. Breeding deficiency.
4. Diseases of the udder.
5. Pneumonia in calves.
6. Scours in calves.

And that he must view it from the aspect of these conditions if we are to make progress in its control.

The farmer is constantly offered remedies for the prevention of abortion disease with a guarantee of money refunded if abortions occur. It should be pointed out to him that while the disease continues, the four main features are not equally in evidence all of the time, and that abortions in particular come in waves, reaching a high percentage and then subsiding, and that if he will read carefully the guarantee with the abortion remedy, he will note that it eliminates any controls. The guarantee usually provides for the refund of the money if the remedy is used according to directions and if it is used on *all cattle* on the farm.

This is plainly to keep the farmer from using the remedy on part of his animals and leaving part untreated, and incidentally discovering that as few abortions occur in the untreated animals as in the treated.

It should be pointed out to the farmer that two of the main features of Bang's disease are antagonistic. I refer, of course, to abortions and breeding difficulties. If there is much of the latter in the herd, of necessity later there will be less of the former. Of course, a cow that does not conceive will not abort. And, in the very nature of things, these two features tend to alternate to some extent.

Of the four main features of Bang's disease, abortions, retained placenta, breeding difficulties and udder troubles, I think that breeding difficulties are the most important, and udder diseases are second in importance to the dairyman. When the dairyman can be brought to see this, he will lose some of the complacency that he now has when abortions in his herd are few or absent. So long as he looks upon abortions as being the only loss he suffers from the disease, he will not appreciate its importance or co-operate desirably in measures for its control.

* Notes from an address by B. J. Killham, Lansing, Michigan, at the Eighth Annual Post-Graduate Short Course for Veterinarians, Michigan State College, East Lansing, January 26-30, 1931.

I have some statistics relating to Bang's disease in a large group of cattle that may be interesting. A study of the infected cattle in this group shows that 6% of the animals never conceived; 67% aborted, and 27% continued to produce calves throughout the period of observation, a period of several years.

Of the animals aborting, 65% aborted once, and of them 28% were thereafter sterile. Of those aborting, 23% aborted twice, and of these 33% were sterile thereafter. Five per cent aborted three times, and of these 100% became sterile after the third abortion. Five per cent aborted four times, and of these 50% were sterile after the fourth abortion. Two per cent aborted five times, and all were thereafter sterile. Of the whole number in the herd, 31% aborted three times or more or became sterile, and this herd was taken care of unusually well. The average herd would show a higher percentage of sterility because these animals, being very valuable, were treated as long as there was any hope of breeding them.

I think it would be generally admitted that the animal that is going to abort three or more times or become sterile, is without value to the dairyman, and thus the attack of Bang's disease in this herd was as serious as if one-third of the animals had died promptly. Even a partial analysis of the cost of keeping the unproductive cow should show the tremendous effect of Bang's disease in this respect; and this is a condition folks call abortion disease.

I remember one farmer who stated at one of our meetings that he had had abortion disease in his herd, but that he was entirely free from it now. Inquiry developed the fact that he had eleven cows and at that time he was not able to get any of them with calf. Manifestly, he had no abortion in his herd, but equally manifestly he was not free from the disease.

Our present plan of abortion control in this state comprises three phases, (1) the blood test, (2) segregation, and (3) sanitation.

The blood test is the initial procedure and we cannot get anywhere without it. It has its vagaries but is dependable. Under certain conditions some infected animals will fail to react to the blood test. In advanced pregnancies and shortly after calving, some animals fail to react, but apparently this failure to react at this period is not as general as it has been thought to be.

Segregation may be either partial or complete. It is the function of the veterinarian on the ground, acquainted with all conditions, to go into this phase of the matter with the owner in detail. No two situations are ever exactly the same. We have 120 herds in the state that we call demonstration herds. In no two of these herds are the conditions exactly the same, and a logical plan of procedure has been mapped out for each individual herd.

If only one animal out of a herd of 10 or 12 is infected, obviously the thing to do is to send her to slaughter. That is the least expensive plan with such a herd, except under very exceptional circumstances. The owner must be sold on the idea that a single test may not reveal all the infection, since certain animals may be in the incubative stage of the disease and will not react until later.

I recall a case where in a herd of 35 cattle, two reactors and one suspect, were found on the first test. All three were removed from the herd and it was not tested again for ten months, at which time 16, or just half of the remaining animals were reactors. It is almost obvious that this herd was tested very soon after the disease made its appearance in the herd. It was on the upgrade and spreading rapidly and a number of animals were in the incubative stage and were not detected by the test. Had a second test been made 30 days after the first, it would doubtless have revealed other animals and perhaps have prevented a disaster in this herd.

Our experience has shown that it is easy enough to get a farmer to start and make the first test, but hard to get him to keep going a sufficient length of time to get anywhere. This is probably due in part to the fact that we have been establishing what we call demonstration herds in various localities, herds with which we assist the local veterinarian

on the first test. In some instances, apparently, farmers will ask for this first test because it is cheaper, and without any intention of carrying it further.

If several cows in a herd react there are several things to be considered, of which the most important are the age, value and productive ability of the reactors, the facilities and equipment on the farm and the type of owner. The average dairymen in Michigan are not in a position to establish complete segregation of diseased animals. Where two brothers or a father and son have farms near together and desire to undertake this work, it affords an opportunity for complete segregation. The reactors are put on one farm and the non-reactors on the other. On the latter farm, the clean herd is raised for both men. However, it doesn't work out so well as one might think. They may start out with the herds and the work somewhat evenly divided, but soon, due to the loss of cows and failure to breed, abortions, udder troubles and one thing and another, the man with the diseased herd soon finds himself with little to do and that man with the clean herd is doing about all the work for both. Naturally this leads to dissatisfaction.

Where complete segregation cannot be practiced, we must regard every diseased animal as a menace, and use good judgment in eliminating those of little value and continuing to cull the herd. Even then there are holes in the plan, but there are holes in all plans. There were holes in the tuberculosis eradication plan in Michigan and yet we reduced that disease to less than 0.5% in the whole state. We can do considerable with partial segregation; in fact culling alone will sometimes clean up a herd, but it is an expensive method and a slow one.

Under average conditions, it is the infection that is spread at the time of abortions and for the first few weeks thereafter that is the serious menace. The infection in the udder will not normally be spread to adult cattle, and so through segregation of all infected cows for a few days before and three or four weeks after calving, whether it be a normal calving or an abortion, we can accomplish much.

The most serious spread of this disease is due to abortions at pasture, and the cattle owner should take measures to eliminate such danger. Unless the owner will segregate promptly every animal showing evidence of approaching abortion or calving, the progress in the control of the disease will be slow and subject to many setbacks.

Most farms where the conditions are ideal for handling the disease, have little of the disease. It is on those farms where the equipment is the poorest that we usually have most of the disease and the greatest difficulty in handling it. But, a separate maternity stall can be provided on any farm. A horse stall, pen, shed or small outdoor enclosure can be used, or a tar paper shack can be built at a cost of not more than $10.00 to $15.00. If the man can't afford to go to this little expense, to get rid of Bang's disease he had better go out of the cattle business.

The most fortunate thing in connection with the disease is the fact that animals under one year of age possess a high resistance to it and that the bull is seldom infected. These two facts aid greatly in the control of the disease and in its eventual eradication from the herd under conditions that would be hopeless if this disease spread to the young animals and to the bull as does tuberculosis.

In the matter of sanitation, the average farmer needs a good deal of education. It should be commenced by getting out of his mind the idea that a strong smelling disinfectant will keep abortion disease or hog cholera or other diseases out of his barn or off his quarter section of land. He must be taught that fire is a good disinfectant and that it is a good plan to burn aborted fetuses and fetal membranes; that thorough cleanliness, dryness and exposure to sunlight are far more important in ridding the premises of infection than any amount of disinfectants that it is practical to use.

It has been determined that *Br. abortus* is killed in two days by exposure to sun light, but that in moist manure located in a dark place it has lived 75 days and longer.

We make no attempt to tell a veterinarian

how much he should charge for drawing blood samples or for the other work in connection with the control of this disease. No one should attempt to tell him this, but we do urge that just now when dairymen are greatly affected by the low price of dairy products and when this campaign for control of contagious abortion in the state is just starting, that the veterinarian make as reasonable a charge as he can afford, that he organize his work to keep down the mileage charge as much as possible.

We do not favor a per animal charge for collecting blood samples. The conditions differ. I recently spent four hours of the hardest kind of work in collecting eleven blood samples. There was not a stanchion on the farm, nor any lumber with which to build a chute. In addition to this, the animals were wild and unruly. We had ropes but no post or horse for the other end. Obviously, the veterinarian cannot afford to collect blood samples under such conditions at a price he would charge for a large herd all stanchioned and where plenty of help is supplied.

The Department of Agriculture is behind a project to accredit herds as free from Bang's disease and we ask veterinarians to urge the owners of good herds to undertake this work. It is important to the success of the project that we build up immediately a source of clean animals for men who want them. It will be much easier to get owners to dispose of diseased animals if there is a source from which they can obtain clean ones.

Great patience is required to carry on this educational work. I recently talked for an hour on the project at a meeting of dairy farmers called for the purpose of considering the control of abortion disease in their herds. I then spent another hour in answering to the best of my ability, questions propounded by nearly every one present. After the meeting adjourned, one of the men came to me and said: "I have got this disease in my herd. Is there anything to do about it?"

REGULATORY ASPECTS OF ABORTION DISEASE CONTROL*

Bang's disease is the most serious economic problem confronting the live stock industry of Illinois. Only a few years ago, the wildest imagination could not have foreseen its importance nor the gravity of this problem with which the live stock industry must deal. We are only now learning its importance.

Abortion is a poor name for this disease. There is much yet to learn, but we have already learned that abortion in cattle is only one symptom of Bang's disease and is not its greatest cost to the dairy industry.

Sufficient is known concerning the disease to successfully eradicate it. The many Bang's disease free herds in various parts of the country demonstrate the practicability and economic soundness of eradication.

On May 15, 1930, the State Department of Agriculture promulgated a regulation requiring all imported dairy and breeding stock to be free from Bang's disease as shown by a negative reaction to the agglutination test. An infection with Bang's disease was defined to include all animals giving a positive reaction to the agglutination test or that have been injected with live culture vaccine for a period of one year, or injected with abortus bacterin within six months.

Accredited veterinarians in this state are required to report promptly the use of live abortion vaccine on any animals. It is somewhat surprising that, in spite of all authority on the subject and in spite of the fact that there is no hope of eradicating the disease from a herd by the use of live abortion vaccine, this agent is still used by many veterinarians in the state. Its use is justified upon the increase of the calf crop alone, and yet I have never heard of a herd being raised to normal breeding efficiency and held at that point for a period of ten years by the use of live abortion vaccine.

Newspaper and general magazine publicity pertaining to undulant fever in man have

*Notes from an address by W. H. Welch, Chief Veterinarian, State Department of Agriculture, Springfield, Illinois, at the Twelfth Annual Illinois Veterinary Conference, University of Illinois, Urbana, February 10-12, 1931.

been unfair to the dairy industry. They have taken no account of the protection afforded consumers of milk by pasteurization, nor has the low incidence of the disease among the consumers of raw milk been adequately pointed out. There should be no unfavorable propaganda at any time directed against so healthful and so wholesome a food as milk.

There is no objection among the farmers to testing for this disease as there was for tuberculin testing. No other work gives a veterinarian so much prestige with the farmers as does a properly conducted agglutination test for Bang's disease. The farmer is usually pleased because the test points out the animals in most instances that the owner already suspected had something wrong with them. It verifies his judgment and thus pleases him.

We expect the Bang disease control project to grow in this state. Already six schools for instructing practitioners in the technic of the test and the practical application of control measures have been held in this state and have been attended by 150 veterinarians. Forty-eight veterinarians have been approved for doing this work. The work is handled co-operatively between the State Department of Agriculture and the University, and the University requires that the last blood test before the herd is certified as abortion free must be made on samples drawn by veterinarians and sent to the University laboratory for the agglutination test.

Specific identification, the age, color, markings and breed of the cow must be given on certificates for interstate shipment.

All dairy and breeding animals coming into the state at this time are free from the disease, and veterinarians should render every aid to the work of notifying purchasers that such animals must not be placed in an infected herd. Usually they will be the first to abort where this is done. We cannot tell our clients too often not to buy clean animals unless they know that their own herds are clean, and also that they can never clean up a herd by simply buying clean animals.

At the present time the requirements that animals must give a negative reaction to the agglutination test are not imposed on animals shipped into the state for exhibition or for animals within the state exhibited at state and county fairs. This is a matter that must be taken up soon. There is already a demand from progressive live stock men that this be done.

The Attorney General has ruled that the regulation applying to the importation of animals applies to truck owners, the operators of ferries and to toll bridges, just as it does to railroads. Nevertheless, we know that a great many animals are "bootlegged" into the state in trucks without any sort of certificate of health. Local veterinarians could be a big help to the Department of Agriculture by notifying them of such occurrences when they come to their knowledge.

TORSION OF THE UTERUS IN COWS*

This condition is very common in milch cows that are kept in stanchions. It occurs usually when the calf gets pretty heavy and the cow, in getting up, slips when up on her hind feet, but still down in front. The great length of the uterine ligaments in the cow favors this occurrence.

Symptoms are much like those of constipation. That is, there is straining and one will often find such cases where the farmer has poisoned them by the drastic use of cathartics. If the condition is not reduced, rupture or strangulation of the uterus must result with an emphasematous calf.

We try to get our clients to call us early for such conditions, but once in a while in our outlying practice, we are not called until the case is of considerable standing. Usually these animals are ready to calve or about ready to calve when we are called to see them, and delivery should be undertaken at once.

As a general proposition, we bed down a space 10x30 or 40 feet. The roadway

*Notes from an address by T. H. Ferguson, Lake Geneva, Wisconsin, at the Eighth Annual Short Course for Graduate Veterinarians, Alabama Polytechnic Institute, Auburn, February 2-7, 1931.

in the barn will often do for this. The cow is cast, and all four feet tied together with just a little slack to enable the legs to bend. It is essential to have two or three helpers or enough to roll the cow quickly and to explain to them exactly what is to be done.

Then, with the hand in the vagina, instruct the helpers to roll the animal over and to make it snappy. If, when the first roll is made the twist in the vagina is tightened, it is an indication that the animal was turned the wrong way. If it is loosened somewhat, she is being rolled in the right direction, and this should be continued until the twist is all out.

The fetus will usually be found in an incorrect position and the position should be corrected if possible before the animal is let up on her feet. In such cases, there is always a weakening in the uterine walls and any deviation from normal in the position of the fetus is bad.

When the uterus is in a normal position and the position of the fetus is correct for delivery, the animal should be let up. She is usually anxious to get up and will do so readily unless affected with paralysis, and this sometimes occurs as a complication of torsion of the uterus. If milk fever is present, as it sometimes it, it should of course be relieved.

Often some time is required to dilate the uterine os. When all is ready for delivery of the calf, it is usually necessary to give the more or less inert uterus some help. After delivery, the uterus should be examined carefully to see that it is in good repair. Slight ruptures usually can be repaired at that time with good results. Afterwards, nothing can be done for them. They usually result fatally.

Occasionally, torsion of the uterus is irreducible. This sometimes occurs where there are twins and it is sometimes due to abdominal adhesions. In such cases, of course, an immediate laporotomy is indicated. Some have reported good results from a manual untwisting of the uterus by means of an incision in the abdominal wall, but I have never been able to turn the uterus in this way that I failed to untwist by rolling the animal, and I think we may accept it as a principle, that any uterus that can be untwisted manually through the abdominal wall, can be untwisted by rolling the animal. However that may be, when the abdominal incision is made and the torsion cannot be relieved, it is necessary to remove the fetus through the wall of the uterus by caesarean section. For this purpose, the incision in the uterus is made by preference in the dorsal surface. After removal of the fetus, the uterus is sutured, the adhesions broken down and the organ placed in the normal position. Sometimes a gangrenous area is found and in such cases there is small chance of recovery.

After removal of the fetus, by caesarean section, the cervix should always be dilated, to permit the free outflow of secretions.

THE PRODUCTIVE YEARS OF A DAIRY COW*

A critical age in the milk cow may be said to be about ten years. If she has been a heavy producer, as the age of ten approaches, she usually develops trouble in the reproductive organs or in the udder, or both. Not much more can be expected from such a cow and the dairyman ordinarily considers that it is not worth while to treat her, for what is left in her. Of course, we all realize that there are exceptional cows that breed regularly and maintain a heavy production of milk for years beyond this age, but if you go down the milk line in the ordinary commercial dairy, you will find only occasional cows more than ten years old.

So, in examining a man's herd for mastitis, one must take this into consideration and the dairyman should ordinarily be advised to dispose of cows ten years of age or older in which chronic or more or less acute

*Notes from an address on Testing for Mastitis, by D. H. Udall, Department of Medicine, Obstetrics and Ambulatory Clinic, New York State Veterinary College, Ithaca, at the Sixth Veterinary Conference, Ohio State University, Columbus, March 18-20, 1931.

mastitis is discovered. Another thing to be taken into consideration is the period of time the animal has been in the herd. In recently purchased cows, in which evidences of mastitis are found, the fact of recent purchase counts against them. It is likely to mean that this cow has been disposed of by some other dairyman because she was subject to recurrent attacks of mastitis. It is easy to cover up mastitis in a heavy springer. These cows and cows that have just freshened will fool the best of us.

TEAT FISTULAE*

Fistulae of the teats in cows are of two kinds, (1) traumatic and (2) congenital. The treatment of the two kinds are similar, except that the congenital fistulae may communicate with the small gland, which may require treatment after the fistulae is cured.

Restraint necessary for this operation is rather important, but offers no difficulty of attainment. I prefer to operate on the animal standing. For this it is best to use a stanchion and a nose lead. Then put a loop round the hind leg just above the hock on the side on which we are going to operate and attach to the ceiling so that the leg can be lifted sufficiently. At this point, one should give the animal some time to accustom herself to standing on one foot and to learn that she cannot get the other foot forward. We must have good restraint for any teat operation.

The site of the operation requires to be carefully cleansed, and a local anesthetic should be used. The fistulae may be as much as two inches long and may communicate with the milk tube of the teat. A milking tube should be inserted well up to the base of the teat and a rubber band put on at the base of the teat to hold it firmly and to prevent hemorrhage.

The fistula will have an epitheleal lining. This must be completely removed, since it is to some extent a secreting membrane, and, if any part of it be left, it will result in a cyst, and probably prevent healing of the wound. Perhaps, all things considered, it is best to dissect out carefully the lining membrane of the fistulae, clear down to the milk duct of the teat. However, a successful method is to cauterize it with a needle heated to a cherry red. It requires some skill and experience to cauterize just enough and not too much. A fresh wound resulting in a milk fistula is treated the same as a chronic fistula, except that there is no lining membrane and cauterizing or dissecting the lining membrane is not required.

An elliptical incision around the orifice is made through the skin and subcutaneous membrane, and any old scar tissue, if present, removed. The wound is sutured with a figure eight suture and a light coating of iodized ether put on. This is covered with collodion and plenty of adhesive tape for strength.

If the fistula is connected with the milk duct of the teat, it is then necessary to cut the sphincter of the teat completely through, so that the milk will flow out freely and cause no pressure on the sutured wound.

*Notes from an address by T. H. Ferguson, Lake Geneva, Wisconsin, at the Eighth Annual Short Course for Graduate Veterinarians, Alabama Polytechnic Institute, Auburn, February 2-7, 1931.

REPLACING THE EVERTED UTERUS*

When one is called to a case of this kind the cow is usually down. It is essential first of all to have plenty of warm water. A ten-gallon milk can full is none too much.

I begin by placing about six gunny sacks (as clean as may be obtained) under the everted uterus, and then pour water over the organ, washing carefully and removing one of the gunny sacks. This can be repeated three or four times and the organ will be fairly clean.

At this time, I push a board under the remaining gunny sacks, and have a man hold each end. Get the animal on her feet, making sure the assistants hold up the weight of the uterus. The animal is given a small injection, not more than 20cc of a 1 per cent solution of procain, into the spinal canal—the ordinary epidural block. The quantity injected must be adjusted to the size of the cow, the aim being to anesthetize the uterus

*Notes from an address by T. H. Ferguson, Lake Geneva, Wisconsin, at the Eighth Annual Short Course for Graduate Veterinarians, Alabama Polytechnic Institute, Auburn, February 2-7, 1931.

and at the same time leave the animal enough sensation in the legs to enable her to stand. While the anesthetic is taking effect, the cleaning of the uterus, so far as is possible without damaging it, is completed.

A sack, sugar sack, flour sack or pillow case that has been wrung out of warm water is then slipped over the organ for protection. The next step is to reduce the congestion if possible, and it usually is possible if one goes about it right. This is done by pressure carefully applied. The sack covering the uterus affords a useful protection and prevents one from running his fingers through the organ. The most convenient way to apply general and yet sufficient pressure to the organ is by the use of an inner tube of an automobile tire. Use an old one that has become thin and pliable. Split it from end to end and carefully wind it about the uterus, stretching it slightly so that continuous pressure will be applied. In a very few minutes the blood serum will be squeezed out of the organ and back into the general circulation.

When the uterus has been decongested to a point where it can be replaced without much difficulty, it is pushed back into place, still covered with the sack until it is well within the vagina. With the sack removed, smooth out any kinks in the uterine cavity and get it into normal position. This is important to prevent straining after the effects of the anesthetic have worn off and perhaps a re-expulsion of the organ.

When the uterus is fully in position again, it is well to inject a quart or more of neutral oil, to which all of the lugols solution or all of the iodine it will take up, has been added. This gives the oil a nice reddish color, perhaps adds something to its antiseptic value, and is worth while. This bland oil in the uterus seems to act very advantageously. It sort of fills it up and gives it body and I believe retards putrefaction. It should be left in the uterus to be expelled as the organ contracts.

No further treatment is required unless complications set in. Some, as a safety precaution, deem it well to suture the vulva. If this is done an X suture should be used, with strong tape, inserting the suture through the skin well over to the side just about to the hair line. The suture should not go through the lips of the vulva.

CATTLE BREEDING PROBLEMS*

Albrechtsen states that uterine catarrh is the most important cause of sterility. I think probably this is true, but there seems to be no end of things that may cause sterility in cattle. You are probably familiar with the experience of Eckles in the Red River Valley of the north, where he obtained an average of only one calf per cow in two years. The trouble was determined to be a phosphorus deficiency and the addition of bone meal to the ration overcame the trouble.

This is just an example of nutritional sterility. Others could be cited. I have encountered other herds in which a low breeding efficiency was determined to be due to calcium deficiency. A change in the diet, adding more calcium, overcame the difficulty.

Notwithstanding that there are nutritional causes for sterility and functional causes and various others, I believe that the Bang organism is the most important of the basic causes, and that eliminating it from the herd will in the ordinary case, reduce breeding problems greatly. However, it will not eliminate all of them. You will still have a good many to contend with.

The sire is frequently responsible for a low breeding efficiency in a herd and of course, may be responsible for entire sterility in a herd. This is particularly true where an aged sire is used, and when we attempt to solve the breeding difficulties on any particular farm, attention to the sire must not be overlooked. Very young sires likewise, are by no means uncommonly responsible for low breeding efficiency in a herd.

A young sire improperly cared for is frequently responsible for shy breeding. Such matters as diet, exercise and overbreeding must be taken into consideration. If the animal is two years of age, lack of exercise

*Notes from an address by Willard Boyd, Professor of Veterinary Medicine, University of Minnesota, St. Paul, at the Sixth Veterinary Conference, Ohio State University, Columbus, March 18-20, 1931.

is more likely to be the trouble than anything else. Bulls that have reached this age are often disagreeable, even dangerous to handle. They are able to, and frequently inclined to, smash fences and as a result may be kept in a stall or kept tied up. The bull that is so handled is not likely to long remain a strong fertile prepotent animal. The bull must be given a lot to himself where he can roam about and get some exercise, lots of sunshine and an opportunity to see other cattle.

One sees occasionally in white shorthorn heifers a condition that is usually discovered only by rectal examination. These animals have an undeveloped uterus and the vagina ends in a blind sac. The ovaries may or may not be normal. One is apt to make a mistake in such animals unless the rectal examination is made with great care. It is far more difficult to make a rectal examination of the genital organs in beef cattle than it is in the dairy cow. The trouble in these cases, of course, is a developmental error and there seems to be a color linkage. It undoubtedly occurs in all breeds and possibly in all colors, but it is seen more frequently in white shorthorn heifers than in others. I have seen only one case in a Holstein and that was in an almost pure white heifer.

Tumors occasionally occur in the genital organs, but they are not common. I remember finding a tumor of the ovary that was weighed after the animal was slaughtered, and it weighed 40 pounds. Very large fibromata are occasionally found in the vagina so large that they mechanically interfere with breeding.

The condition of leukemia, I believe, is far more common in cattle than is generally realized. It is a disease of the lymphatic system and metastasis frequently occurs in the heart and reproductive organs.

Cervicitis is a barrier to conception.

The Bang organism affects largely embryonic tissue. It is not a disease of the cow but of the embryo, the fetus and its envelopes. The organism attains its greatest development in the chorion and hence the aborter retains the afterbirth, and trouble. either temporary or permanent ensues, from the pyogenic infection that follows this accident. Hence, the elimination of the Bang organism will, to a considerable extent, elminate those infections that are dependent upon retained afterbirth and thus eliminate a good many of our breeding problems. It will not eliminate all of them, however.

Recently, I found a metritis due to a mold, an aspergillus. These organisms are present everywhere. The gross lesions are practically identical with those of pyogenic infections. They may cause trouble independent of the presence or absence of the Bang organism.

The pathology of an infection with the Bang organism is one of necrosis. There is first the gelatinous exudate into the cotyledons and where the inflammation is extreme, the cotyledons slough.

The fetal membranes are frequently enlarged in cases of retained afterbirth.

Catarrhal endometritis is a common cause of sterility. It occurs in open heifers and is difficult to diagnose. It readily progresses to pyometra. In cows pyrometra can usually be diagnosed by the finding of pus in the gutter when cows have been lying down, and on examination in the floor of the vagina. If treated early, complete recovery is probable. If the condition is of long standing, apparent recovery may occur, but the animal is likely to remain sterile.

In treating pyometra, I believe it best to siphon off the uterine contents and remove the corpus luteum from the ovary if it is not too deep seated. If the corpus luteum cannot be removed, the uterus is likely to fill up again with pus. Massaging the organ with the hand in the rectum appears to be beneficial.

Cysts in the mucous glands of the uterus are by no means uncommon. They are not difficult to diagnose. In such cases, the uterus is large and flabby and the cyst can be felt plainly. In case the animal is not known to be free from tuberculosis, one should not overlook the possibility of this infection in such conditions.

Cystic degeneration of the ovary and uterine catarrh usually go together, but not

always. It usually helps to douch the uterus in such cases. Since the price of dairy cows has fallen, we are not called to treat so many of this type of cases as formerly.

Hydrosalpinx is a result of uterine catarrh. Of course, it is incurable; as is also pyosalpinx.

I have not found an extensive pathology in the sire. Orchitis is occasionally encountered and if at all severe, of course, renders the animal sterile.

Temporary sterility in the bull is sometimes seen due to papilloma of the penis, and I have seen it the result of a balanitis from douching the penis. Most cases of orchitis that one sees are associated with the *Br. abortus* infection and it is fairly common in bulls that react to the agglutination test for Bang's disease. Fortunately only a low percentage of bulls are infected by this organism.

The orchitis is usually unilateral. If the affected testicle is not removed, the condition will go on to abscess formation and the animal becomes permanently sterile. I do not know why. The unaffected testicle may appear in every way normal, but if there is abscess formation in one testicle, the animal is a non-breeder. I recommend the removal of the affected testicle, just as early as possible.

Of course, it is well established that a double cryptorchid bull is sterile. Some such animals may be made good breeders where the testicular structure is normal by an operation, bringing the testicles down into the scrotum and fixing them there by deep sutures. This is occasionally done where the blood line of the bull is such that the owner is willing to disregard the effects of heredity on cryptorchidism.

PRICES OF FARM PRODUCTS LOW

Butter prices are now 34% below a year ago; hog prices 28% lower; eggs 33% lower; and wheat 30% lower. The cash income of farmers for the first four months of 1931 was 25% below that of last year. These facts must of necessity be taken into consideration in setting the price for veterinary service.

"SAVING" THE MEDICINE

A 400-pound Shorthorn calf in an extremely bloated condition was discovered by a herdsman. As an emergency method he punctured the rumen with his pocket knife, with wonderful results, for the calf immediately got up and seemed again contented with life on a farm. The owner suggested that the calf be given a dose of medicine recently obtained from a veterinarian, presumably as a tonic for a cow that had not done well following a digestive disturbance.

The label on this bottle showed a notation of "Nux & G," which probably indicated "nux vomica and gentian." The indicated dosage for the cow was "one tablespoonful two or three times daily." It was stated by the herdsman that the calf was given about a half of the dose recommended for the cow and in about five minutes the calf let out a bawl, fell down, kicked at his belly, gasped for breath, stiffened out like it had the cramps and seemed to try in every way to die.

A veterinarian was called and was on the premises in less than thirty minutes. By this time the calf was bloated again, which was relieved by trocar and antiferments. Next stimulants were given, with some temporary relief. Finally, the story of the medication with the cow prescription was told. Examination showed the heart beating so fast that counting the beats was impossible. The calf got on its feet, would walk around some, breathing loudly, then fall down and have 'em all over again. About thirty minutes after the veterinarian arrived, the calf's temperature was taken and showed 109.4 deg. F. This temperature continued as long as veterinarian stayed with the case. A promise of death was left with the herdsman, which came true in a couple of hours. Autopsy was not permitted because the "dead man" will not haul mutilated carcasses.

BRUCELLIASIS IN SWINE*

Brucella disease in swine has been looked upon as an abortion disease, but our study in Michigan refutes this statement. The importance of the disease in man caused by brucella organisms makes it necessary that we know a great deal more concerning this disease in hogs than we now know. Agglutination tests and bacteriological examinations were made of each animal in a large herd of hogs. We used tail bleeding to obtain the blood samples, and the test was made as it is made with cattle blood, both by the tube method and the rapid plate method. The two methods were in very close agreement and we feel that the test was very accurate.

Bacteriologic examinations and cultural methods were used for the fetal membranes and various tissues in 180 young and mature swine. These were further checked with inoculation tests, using guinea pigs.

This included 48 bred sows and 10 that failed to conceive or aborted early, unobserved. Of these latter 10 sows, cultures of *Brucella suis* were found in nine. Of the 48 bred sows, one aborted and *Br. suis* was found in the fetuses and in the fetal membranes. This was the only instance in which the organism was found in uterine discharges. A good many pigs in this herd were still-born and an even larger number died within from a few hours to a few days from birth. There was much difficulty in getting the sows bred.

Br. suis was isolated from animals showing a partial reaction in dilution of 1:25 and as high as 1:500. The first test revealed 46 positive reactors. The organisms were isolated from 15 of these hogs. Of the 15 from which *Br. suis* was isolated 13 were bred and nine failed to farrow. One aborted. And, as mentioned above, it was only in this aborting animal that *Br. suis* was found in the fetal membrane It was isolated from each fetus aborted by this sow. In only one case was the organism isolated from the udder.

Brucella disease in swine is more like the disease in goats than in cattle. It is more readily communicated to man than the disease in cattle. Two of the handlers in this herd became infected and suffered from undulant fever.

Very fortunately the tendency of brucella infection in swine is to disappear from a herd in about a year. It is necessary to bring in susceptible animals from time to time to pick up and carry on the infection. The disease is self eliminating and easy to get rid of by testing monthly for four or five months and slaughtering those that react.

A survey was made to ascertain the prevalence of this disease among the swine in Michigan. We had believed and had stated that there was very little abortion in the swine in this state. Our mistake in this was due to assuming that it would reveal its presence by causing abortion. This it rarely does unless it cause the abortion so early as not to be recognized.

We investigated 1,600 animals without selection in 15 herds picked at random in widely scattered districts. Every herd investigated contained infected animals from a few up to 68% of the herd. Our results were compared to those of Hardy in Iowa, and Carpenter in New York. Hardy found a much higher percentage of infection than was found either in New York or Michigan and this probably explains the greater prevalence of undulant fever in that state.

Brucella disease in swine seems to be due to a single species of organism—*Brucella suis.*

The disease causes a high percentage of sterility and the animals soon recover from it. It is essentially a lymph node disease and the organisms appear to have but little capacity to invade the uterus.

Brucella abortus does not appear to be pathogenic for swine. *Brucella suis* is pathogenic for cattle.

* Notes from an address by I. F. Huddleson and H. W. Johnson, East Lansing, at the Eighth Annual Post-Graduate Short Course for Veterinarians, Michigan State College, East Lansing, January 26-30, 1931.

HEM. SEP. IN PIGS FOLLOWING VACCINATION

I was called to vaccinate a herd of 114 two-month-old pigs. These pigs had been raised strictly according to the McLean County System and weighed about 60 pounds. It will be seen they had been doing mighty well. One pig had just died. I held a postmortem examination and from the lesions present, pronounced the condition cholera.

The herd was vaccinated and four days later, the owner telephoned me that three more pigs had died. I told him that these were undoubtedly in the incubation stage of the disease when vaccinated and the vaccination just wouldn't save them, but I thought he would not lose any more.

The next day he telephoned me that eight more were dead. This didn't look like cholera to me. I hastened to his place, and held several postmortem examinations and did not find a thing in any of them to indicate cholera nor any lesions to indicate anything else. Quite a number of the remaining pigs were affected at the time. They were very weak and collapsed and felt as if they had no muscles in them when handled.

The condition looked somewhat like feed poisoning. The feed was checked in every way and not a thing found wrong. Two pigs were sent to the Animal Pathology Department of the University and autopsied and a tentative diagnosis of feed poisoning was made. The only thing abnormal found was too much fluid within the covering of the brain. A microscopic examination of this fluid showed enormous numbers of bacteria present.

Hemorrhagic septicemia was suspected and a 2cc dose of aggressin and 20cc of hemorrhagic septicemia serum was given immediately. Four pigs were nearly dead at the time and they died. The rest all lived.

These pigs had been weaned about three or four days before they were vaccinated, which was on November 14, and they were, as I said, two months old. There were 100 June pigs on the same farm but not in the same pasture. They had been vaccinated earlier. There was no loss in the herd of June pigs.

*Notes from a report on Clinical Aspects of Porcine Meningitis by J. A. Owens, El Paso, Illinois at the Twelfth Annual Illinois Veterinary Conference, University of Illinois, Urbana, February 10-12, 1931.

BRUCELLA SUIS A CAUSE OF LAMENESS IN SWINE*

A veterinarian recently brought two hogs to the University for examination. The history of the herd from which these came was as follows:

From time to time during the past 15 years, the animals had suffered from what was regarded as rheumatism. At the present time one-third of the animals were affected with lameness. There was a swelling of joints of some of them. The two animals brought to the laboratory for examination were stiff and the fetlock joints were swollen and painful.

On opening these joints the synovial membrane was found distended with a creamy, yellow pus. Adjacent sheaths also were filled with a similar pus. The articular cartilages were eroded. The shoulder joints likewise were found to be inflamed, to contain pus and the articular surface eroded and roughened.

From the pus a pure culture of *Brucella suis* Traum was obtained. On inquiry, it was learned that 20% of the gilts and 10% of the mature sows in this herd had aborted. Another animal that was lame was obtained from the herd and was examined. No pus was found in the joints, but the *Br. suis* was isolated from the marrow of the long bones.

It is not believed that all lameness or arthritis in swine is due to the *Br. abortus*. It has been shown that the most common organism in this condition is the *B. pyogenes,* with the bacillus causing swine erysipelas second, and the bipolar organisms of hemorrhagic septicemia third. However, in this herd, we are inclined to believe that the *Br. suis* is responsible for the lameness and

*Notes from an address on Porcine Osteomyelitis by W. A. James, Assistant in Animal Pathology, University of Illinois, at the Twelfth Annual Illinois Veterinary Conference, University of Illinois, Urbana, February 10-12, 1931.

that it may have existed on these premises for the whole period of fifteen years, during which time similar outbreaks of lameness have been noted to occur.

ATYPICAL CASES OF HEM. SEP. IN SWINE*

I was called to see a peculiar condition occurring in a herd of 55 brood sows all in good condition and running on good pasture. A few of these sows had pigs with them. In this pasture there was a pond used as a dump, and through it ran a creek that drained from a sanitarium.

I saw this herd first on May 27th. One animal had been dead about an hour. An autopsy was held and considerable inflammation was found in the cervical lymph glands and in the region of the throat generally. The liver was engorged and swollen. The intestines normal. The stomach contained about a pint of a black, tar-like substance.

A number of animals were pointed out by the owner as acting similar to the way the one that had died and two or three others that had died previously, had acted before death. These animals were drooling, walked very slowly, and about every 12 steps they would jerk the head up sharply. When we attempted to drive them, one fell in convulsions. The fit lasted about three minutes.

The herd was changed to a good alfalfa pasture. The losses continued for about six weeks or until July 1st, by which time eleven sows had died. There was no further loss for three weeks, when sows began dying again, and by the first of September nine more had died. By this time, there were 150 pigs in the herd. None had died of this condition.

Beginning September 1st, the sows were given several doses of mixed bacterins and one 2cc dose of hemorrhagic-septicemia aggressin. There was no further loss in the herd.

*Notes from a report on Clinical Aspects of Porcine Meningitis by J. H. McDonald, Federal Inspector in Charge of Hog Cholera Control, Springfield, Illinois, at the Twelfth Annual Illinois Veterinary Conference, University of Illinois, Urbana, February 10-12, 1931.

URETHRAL CALCULI IN CATS

Urethral Calculus in the cat causing retention of urine is not rare in small animal practice, and yet it is often overlooked.

It occurs more frequently in the castrated cat, than in the tom, and oftener seen in the tom, than in the female.

I have found nothing in veterinary literature about this trouble, and while I know there are some that have recognized it, I know there are many that have not, and yet they may have had many cases.

The diagnosis is made by palpating the abdomen. The bladder will be found well forward and will appear to be from the size of a duck egg to that of a goose egg. It will appear very hard, round, and painful on pressure.

At times pressure on the bladder will start the urine, and a continued pressure will empty the bladder. If this does not suffice get some small probe pointed whale bones, and dip them in cotton seed oil, and pass one into the uretha, holding the penus with the thumb and finger of the left hand, and rotating and massaging while applying the oil with the whalebone and introducing it again and again. The calculus can be felt with the whalebone. After it is well lubricated, again apply pressure on the bladder. If it does not succeed, lubricate and massage again, and again repeat the pressure. When the urine comes if there is a cloth spread on the table, the calculus can be seen.

In some cases it is necessary to give an anesthetic, we get through with most cases without it.

The after treatment consists of diuretics to be given each day; of course this will be neglected after a while then there will be recurrence and each time it recurs the bladder is harder to empty, till finally we fail, and must operate or lose the patient from a ruptured bladder.

Wm. M. Bell.

Nashville, Tenn.

COUNTER-IRRITATION AND ITS FUNCTIONS*

The veterinarian often finds it desirable to set up an acute inflammation in a region covered by heavy muscles or other tissue as above the shoulder joint or in the region of the large muscles of the arm and forearm, or in other localities.

The object, of course, is to increase the circulation and the reparatory processes in the part and thus overcome a chronic inflammation already in existence, or perhaps to promote absorption and reduce enlargements.

Of course, there are a number of ways of doing this. Some use the firing iron, line firing on the surface. Others puncture fire. Both processes are painful to the animal, produce ugly sores and leave scars. Others again, use a "hot" blister that after a few days causes peeling of the skin. This too is painful, produces an ugly sore, which the animal is likely to gnaw or rub, and which may become infected and leave a scar.

A better, cleaner, a more humane and a more scientific method is to inject a small quantity of some irritant solution deep into the tissues, in fact right down to where we wish the acute inflammation set up. I find a solution composed of one-half ounce of Lugol's solution and one-half ounce of water, in which five grains of potassium iodide has been dissolved, a useful one. In using it, one should use care to inject only a small amount at a point, not more than 1cc and to not make the injections closer than one inch or one-and-one-half inches to one another. Where it is desirable to set up inflammation over a considerable area, it may be necessary to make a good many injections, but the rule should be followed just the same. Only a small amount of fluid at a single injection and no two injections close together.

For certain cases of tendinitis, for curb, splints and spavin, there is nothing that will quite take the place of firing. But, there is more than one way of firing. Perhaps all of them are to some extent objectionable, but some methods are far less objectionable than others, and these are the ones the veterinarian should adopt.

In firing, particularly in puncture firing, the field should be prepared as for a surgical operation. The hot iron, of course, can be depended upon to sterilize the tissues it touches, but only those. It cannot keep infection from working in at the sides. About the best advice as to firing is, don't do too much of it. Where puncture firing is done, as for curb or splint or spavin, do not insert the firing iron any oftener than necessary. That is, do not make the points any closer together than you have to and in no case make them close enough to cause the tissue to slough between the points.

Another thing, do not keep the firing iron in position long. Have it hot enough so that it can be inserted quickly and removed before much injury is done to surrounding tissue.

In the case of line firing, always lay out either on the leg or in your mind, a pattern to follow and make the firing symmetrical. Follow some geometric design and not just haphazard lines over the surface, because some slight scaring will be left and if the scars are in regular form, they are much less disfiguring than if they be irregular. In other words, when you line fire, do an artistic job.

After firing, I always apply immediately a mercuric iodide blister and do not cover the leg. Some bandage after blistering. If this is done, of course it requires less vesicant than where no bandage is put on. Somehow I don't like to do it. I like to be able to see the results of my handiwork after a day or two. If the leg is bandaged up, I might get to wondering about whether or not I blistered too much and sloughing is occurring.

Sometimes one has an infected or inflamed bursa to treat. They resist all ordinary methods of treatment, including rest. Such cases I like to inject with a solution of Lugol's solution one part, glycerine one part. This is a useful treatment in the early stages of navicular disease.

*Notes from an address by E. B. Ackerman, Huntington, L. I., New York, at the Sixth Veterinary Conference, Ohio State University, Columbus, March 18-20, 1931.

DIMOCK'S IODIZED OIL

In discussions by Dr. W. W. Dimock published in VETERINARY MEDICINE, I note his reference to an "iodized oil" used in the genital tract of mares. What is the formula of this preparation?—J. S. J., Quebec.

Reply: One dram of iodin crystals are added to a gallon of the best grade of white mineral oil and placed in a warm room and agitated from time to time. In the course of three or four days, the iodin goes into solution and the oil is ready for use.

If it is desired to make up this preparation and use it immediately, one dram of iodin crystals can be triturated in a mortar with one-half ounce of oil, and this added to a gallon of the neutral oil warmed to blood heat and shaken vigorously. It will be ready for use in a few minutes.

EQUINE PRACTICE*

Equine practice constitutes only 30% of my practice. Years ago, we used to say that it took 1,000 city horses to maintain a veterinarian. That is probably still true. So it is easy to tell by taking the number of horses in a given city how many veterinarians can expect to make a living in equine practice in that city.

One of the things that a veterinarian is frequently called upon to do is to examine a horse for purchase or perhaps purchase it for a client. One of the first things he must decide upon is whether the animal is sound. Few know how to describe a horse properly. The description should include: (1) general description, color, age, sex, height, weight; and (2) the individual characteristics and markings.

During the World War I personally examined more than 10,000 horses for the French government.

Azoturia, of course, is one of the frequent ailments of city horses. In the old days when our time was taken up very largely with equine practice, we used to expect a great many cases of azoturia where a holiday fell on Saturday or Monday, giving the horses two days without work. Azoturia sometimes develops after one day's rest and occasionally after four days, but two days is the most dangerous time. In only one instance have I seen azoturia in a horse that was laid up from work only one-half day.

At the time I became chief veterinarian for the Health Department of New York City, there were 120,000 horses in the city and we averaged 600 cases of glanders a year. There is no glanders in New York City now.

*Notes from an address by E. B. Ackerman, Huntington, Long Island, New York, at the Sixth Veterinary Conference, Ohio State University, Columbus, March 18-20, 1931.

AZOTURIA IN HEAVY HORSES

Upon answering a call, I found a horse weighing about 1,600 pounds, pulse hard, 60 heart beats per minute, temperature 104° F. Being a mare, I cathetized her getting a diminished amount of the usual coffee-colored urine. Diaphoresis was very free, accompanied by accelerated respiration, the conjunctivae were much injected.

To quiet the excitability, I gave at once one ounce and a half of chloral, and made up a mixture of fluid extract of belladonna and cannabis indica in sherry to give every hour, to effect.

I drew a gallon of blood and injected an equal quantity of normal salt solution. I gave her a pint of salt solution twice during the night, with usual fever preparations each hour.

She drank water very sparingly during the first day, but very copiously during the second. On the third day, she was up on her feet and doing nicely. Cathetization was unnecessary, the normal amber color had returned to the urine and she seemed normal in every way.

I have used in the past large and repeated doses of magnesium sulphate administered with the stomach tube after stomach lavage which has given me some good results in what appeared to be hopeless cases. Also, the adrenalin treatment has worked nicely for me at times.

If others have had good success with any line of treatment, I for one would like to hear from them through the columns of VETERINARY MEDICINE.

I should have prefaced my remarks by

the statement that I usually give an aloetic purgative with a dram of calomel.

Ralph W. Balkam.

Matawan, New Jersey.

VETERINARY MEDICINE IS MEDICAL ZOOLOGY

Beautifying a Plantigrade

Two strangers came to my office making inquiry for a veterinarian. I told them I was the man they were looking for. They asked if I was busy. I said, "No, what can I do for you?" They had an obstreperous bear and wanted his toe nails clipped, his tusks cut and a ring put in his nose. On second thought, I told them maybe I was busy, but I would go and see the bear. He was in a cage setting on the ground. I got a chain around his neck and a rope around his hind legs. Then I proceeded to tie the rope to a tent stake and get his head pulled out when the door was raised. While two men were trying to pull his head through the open door, he took a shoe off of one man. I had cotton, an empty ten-pound lard bucket, and some chloroform, and when I got it over his nose he became a good bear in jig time. My work was finished very quickly. There was quite a crowd outside the tent, but no one came in to watch the operation. The operation was a success.

A Wounded Leopard

I was called to operate on a leopard that had been shot in a show with a pistol that was supposed to have only blank shells. We roped him, tied him and proceeded to open up his wound, applied an antiseptic wash and provided drainage. I did not chloroform this fellow, as they are so much like domestic cats I was afraid of the outcome. The wound healed promptly after the operation. If at any time you are looking for a good fight, just tackle one of these big cats.

Mange in Wolves

A call came one day to treat two Alaskan wolves that had mange. When I opened the door of their cage to look at them at long distance I am sure they showed me at least one inch of fangs. The owner said he would guarantee they would not bother me so long as he was present. I was quite skeptical but had faith in my man, so prepared a tub of lime and sulphur dip and proceeded to give my charges a good bath. This treatment was successful.

A Strained Back in a Bob-Cat

Was called to see a bob-cat that had fallen and injured his back, and was apparently paralyzed. This cat was restrained by placing a piece of good thick canvas over his head and front feet and a good strong man holding his hind legs. I proceeded to examine him and, according to the newspaper the next day, I gave the cat a good chiropractic adjustment and he recovered in a few days.

Elk Suffer from Specific Mange Mites

I was called into Jackson's Hole country to investigate a disease of elk. There were about 5,000 elk there and they were being fed hay by the state and federal governments. There were three feeding grounds. I found the hay was musty and mouldy and this was, in my judgment, the cause of the loss in the young elk. On the same trip I discovered a number of elk, mostly the old bulls, with scabies. I killed one and sent a portion of the skin on to Washington, D. C., and they reported finding psoroptic mange mites. There were cattle feeding with the elk, but there was no spread of the disease to the cattle. Apparently the mites that affect the elk do not infest cattle.

Working Over a Menagerie

A squirrel with a broken front foot was presented for treatment. I found when I started to work that its foot reached only to the end of his nose and all the time I was working those sharp chisel teeth were chattering. The bones were adjusted and splints applied, but by good luck I did my work without being bitten, and to my surprise the squirrel never bothered the bandage, and in three weeks was able to hit on all four again. I have also treated monkeys, a parrot and a ca-

nary bird with a broken leg, also a deer that had been captured and was becoming a pet at one of the dude ranches. I have had several calls to silver fox ranches, and of all animals I have ever treated I think they have the most nerve. I have never heard one of them make a noise while being operated upon, but it is always best to have their mouths securely tied, for they know how to bite and will not let loose once they secure a hold unless you put them down to where they have their feet on the ground.

A. W. French.

Sheridan, Wyo.

GLIMPSES OF VETERINARY MEDICINE IN EUROPE*

The tour of Europe last summer participated in by about 30 American veterinarians and 40 members of their families and friends, was an official tour. The word official carries far more weight in Europe than it does in this country, and gave us plenty of prestige abroad. We were treated wonderfully well.

Most European veterinary colleges consist of 10 or 15 to 25 buildings scattered over many acres of ground. Most of the veterinary colleges in Europe owe their origin to military needs and still cater to a considerable extent to the needs of the army. They have about four times the man power on their faculties than we have on the faculties of our veterinary colleges.

We were told that the annual cost of maintaining the Berlin Veterinary College was $1,200,000 and Germany has four other schools besides this, and furthermore, don't forget that the equivalent of a dollar is hard to get over there.

The buildings that they use were often erected for a purpose other than for schools and frequently the space in them is not used, nor cannot be used efficiently.

The veterinary profession of Europe, except for Great Britain, is heavily over-supplied. We were told that there were 200 qualified practitioners in Berlin who were engaged in other lines of work and half as many each in Vienna and Paris who have foresaken veterinary practice for other fields of activity.

There were about 3,000 students in the 14 schools that we visited. Of these, 1,400 were in the five German schools. All the other professions are equally as over-supplied as is the veterinary profession.

Veterinary instruction is on the same plan as instruction for other professions. The same entrance requirements prevail and the same period of study is required for graduation.

Words fail to give a conception of the dilapidated condition of the buildings of the Royal Veterinary College in London. One just simply has to see the housing of that school to appreciate its condition.

There is more specializing in veterinary practice in Europe than there is in this country. Specialists in surgery, sterility, small animal practice, etc., are numerous. Horse practice is good in some of the cities, but the horse is being replaced rather rapidly there as he was here a score of years ago.

*Notes from an address by A. F. Schalk, Professor of Veterinary Hygiene, Veterinary College, Ohio State University, Columbus, at the Eighth Annual Post-Graduate Short Course for Veterinarians, Michigan State College, East Lansing, January 26-30, 1931.

TREATMENT OF BLACKHEAD IN TURKEYS WITH COLLOIDAL IODINE*

Colloidal iodine given internally even in one to two ounce doses cannot reach the blackhead organism. Nevertheless, we have received reports from everywhere telling of promptly stopping outbreaks of this disease in turkeys from the use of colloidal iodine.

We have given this agent experimentally a few times in blackhead with excellent results. Birds that were nearly dead and we had every reason to believe would be dead within a few hours, have been up within 24 hours after dosing with colloidal iodine and have gone on to complete recovery.

*Notes from an address by W. L. Chandler, East Lansing, Michigan, at the Eighth Annual Post-Graduate Short Course for Veterinarians, Michigan State College, East Lansing, January 26-30, 1931.